

MONTEZUMA NATIONAL WILDLIFE REFUGE
SENECA FALLS, NEW YORK

ANNUAL NARRATIVE REPORT
CALENDAR YEAR 1995

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
NATIONAL WILDLIFE REFUGE SYSTEM


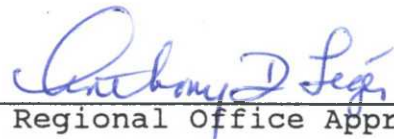
REVIEW AND APPROVALS

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Seneca Falls, New York

ANNUAL NARRATIVE REPORT

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 Refuge Manager	<u>03/31/97</u> Date	Refuge Supervisor Review	Date
 Regional Office Approval		<u>6/23/97</u> Date	

INTRODUCTION

Montezuma National Wildlife Refuge is located at the north end of Cayuga Lake in the Finger Lakes Region of New York State. The refuge contains 2,785 hectares (6,882 acres) and is situated in Seneca County. The refuge is 35 miles west of Syracuse, 40 miles north of Ithaca, and 45 miles east of Rochester. Land was initially acquired under Executive Order 7971, dated September 12, 1938. The purpose of the acquisition was: "...as a refuge and breeding ground for migratory birds and other wildlife...". For other lands acquired under the Migratory Bird Conservation Act (16 U.S.C. 715-715r), as amended, the purpose of acquisition was: "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds".

Proposed objectives for the refuge are as follows:

1. Maintain and, when possible, enhance resting, feeding, and nesting habitat for migratory waterfowl and other migratory waterbirds.
2. Provide resting, feeding, and nesting habitat for bald eagles and ospreys (a state-designated threatened species).
3. Within constraints imposed by the two objectives above, efforts shall be made to provide adequate habitat diversification to permit the presence of self-sustaining communities and populations of other life forms that are typical of central New York State.
4. Provide opportunities for public wildlife education and enjoyment when these opportunities are compatible with the above objectives and the reasons for the area's establishment.

LAND TYPE INVENTORY

<u>LAND CLASSIFICATION</u>	<u>HECTARES (ACRES)</u>		<u>% OF TOTAL</u>
Wetland Types:			
Riverine	17	(42)	0.6
Palustrine	1,457	(3,600)	52.3
Bottomland Hardwoods	728	(1,800)	26.1
Active Agriculture (converted muck)	147	(362)	5.3
Upland Types:			
Grassland	262	(648)	9.4
Woodland	81	(200)	2.9
Brush	69	(170)	2.5
Administrative Lands (Buildings, Parking, Roads, etc.)	24	(60)	0.9
TOTAL REFUGE ACRES	2,785	(6,882)	100.0

Fall peaks of Canada geese approximate 50,000 birds; in spring this number has exceeded 100,000. Approximately 15,000 snow geese use the refuge in spring. Late fall use by mallards has approached or exceeded 100,000 birds. Use by American black ducks in the fall often reaches 25,000. Approximately 1,400 ducks and geese are produced annually.

Use of the refuge by other water-related avian species is significant. Bald eagles have been common at Montezuma since the hacking program was discontinued in 1980. They have been resident on the refuge since 1986, and first mated in 1987. Eagles have successfully nested on the refuge for seven of the last nine years, producing sixteen young. Two pair of osprey continue to nest on the refuge, a rare occurrence for the interior of New York. There are also nesting colonies of black-crowned night-herons and great blue herons.

Wildlife education opportunities abound for refuge visitors. Approximately 130,000 persons visit the refuge annually. In addition to a stop at the Visitor Center, visitors may drive the 3.5 mile Wildlife Drive and walk the Esker Brook Nature Trail. Some 8,000 area school students are annual recipients of formal on-site and off-site wildlife education programs by trained teachers, volunteers, or refuge staff.

INTRODUCTION

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(Inside Back Cover)

A. HIGHLIGHTS

- U.S. Department of the Interior Secretary Bruce Babbitt visited the refuge on August 9-10 (Section E-7).
- Fee title acquisition of 406.7 acres occurred (Section C-2).
- Drought conditions persisted on the refuge until October (Sections B and F).
- Tschache Pool's full drawdown was extremely successful due to drought (Section F-2).
- Refuge hunts were shortened by drought and government furlough (Section H-8).
- Four eaglets (two each nest) were fledged on the refuge (Section G-2).
- Despite no dollars or FTE's, the refuge struggled with 79 easements on FmHA lands (Section C-2).
- Refuge Manager Gene Hocutt was very active in regional flooding and landfill issues (Section E-8).
- Five student interns and two graduate students worked on the refuge (Section E-4).
- Six major research studies were in progress on the refuge (Section D-5).

B. CLIMATIC CONDITIONS

Weather data are obtained from a weather station at the refuge headquarters, and from nearby Locks 1 and 25 of the New York State Barge Canal System. These data are summarized below.

1995 WEATHER DATA, MONTEZUMA NWR

Month	Temp. °F. Max. Min.		Rain (Inches)	Snowfall (Inches)	Total Prec. (Inches)	44-Year Average Snowfall	53-Year Average Prec.
January	66	-2	1.28	5.00	1.85	16.38	2.08
February	52	-4	1.28	12.50	2.43	16.49	2.33
March	68	4	1.50	6.50	2.16	9.85	2.88
April	76	14	1.23	7.50	1.95	2.72	2.35
May	84	32	1.24	0.00	1.24	0.01	3.28
June	92	42	1.58	0.00	1.58	0.00	3.00
July	96	46	2.34	0.00	2.34	0.00	3.50
August	94	46	3.38	0.00	3.38	0.00	3.30
September	86	34	2.54	0.00	2.54	0.00	3.03
October	78	32	7.14	0.00	7.14	1.68	3.27
November	70	14	2.13	12.25	3.97	4.84	3.43
December	46	2	0.58	20.75	2.22	15.09	2.24
TOTALS	96	-4	26.22	64.55	32.80	67.06	34.69

General weather trends for 1995 included temperatures generally warmer than normal and precipitation much less than normal. Only September and October were cooler than the norm. All other months were generally warmer than usual.

The precipitation story cannot be explained nearly as easily. As the table indicates, total precipitation for the year was 1.89" less than normal -- not too bad. Closer examination reveals there was only 31.5" of snow between January 1 and April, and total precipitation through September was 6.28" less than normal. Hot, windy conditions during the summer caused additional drying. Central New York experienced drought conditions, which were highly variable (from mild to severe) depending on localized storm conditions. The drought had a range of impacts on refuge habitat. By June, grasses were at least partially dead and

cured. Trees and shrubs made little growth; often leaves could be seen wilting on the hotter days. Many pole-sized American elm trees were apparently stressed more than normal, and succumbed to Dutch Elm Disease. Very little fruit and almost no hard mast was produced. It was impossible to hold programmed water levels in the impoundments. Supplemental water from Cayuga Lake was necessary to hold the Main Pool elevation. On the positive side, a planned drawdown in Tschache Pool was highly successful. Various sedges, cattail, smartweeds, and Bidens, along with purple loosestrife, provided total coverage of the pool to a height of about four feet. The drought continued through into October, but was broken by several rain events, including 3.29" on October 21. Despite the 7.14" rainfall total in October, the water level was inadequate for waterfowl hunting, and the season was postponed from the October 19 opening date until October 31.

Snowfall during the year also exhibited "unusual" characteristics. The 1994-95 winter was definitely "open", with 31.5" of snow recorded from January through April. Frequent warm spells during the snow period resulted in minimal or no snow depth through the period. This is in contrast to the November - December period, when a total of 33" of snow was recorded. By year's end, several inches of snow blanketed the ground.

Climatic conditions from 1995 are likely to have negative impacts on resident wildlife. Little winter food in the form of fruit, hard mast, or even new sprout growth, was produced. Snow cover buried most food. The combination of cold temperatures and higher energy "costs" for activity will result in most resident wildlife facing hard times during the remainder of the winter.

C. LAND ACQUISITION

1. Fee Title

Two fee title acquisitions were completed during 1995. Most of the preliminary groundwork was also completed for the acquisition of a third parcel in early 1996.

A.) On June 16 the refuge was notified that the title to Tract 173b had been officially conveyed to the Service. The former owners, Roger and Wanda Waugh, were paid \$45,000.00 for the 14.28 hectares (35.3 acres) of fallow farmland comprising Tract 173b. This upland parcel adjoins the western boundary of the refuge in the vicinity of Tschache Pool and Clark's Ridge.

B.) The refuge was also notified on June 16 that the title to Tract 183 had been conveyed to the Service. This 146.26 hectare (361.41 acre) parcel was acquired from The Trust For Public Land (TPL) for \$513,000.00

Tract 183 represents a significant purchase because the parcel is currently muck agricultural land located north of the refuge. The tract, located within a large, actively-farmed muck-soil complex, presents the refuge with an excellent opportunity to demonstrate how we could restore drained wetlands, manage for wildlife, and cooperate with adjacent farmers without negatively impacting their agricultural operations.

C.) The Furman parcel (Tract 194a) consists of approximately 73 hectares (180 acres) located in the same actively-farmed muck complex as Tract 183. It is anticipated that acquisition of this active muck agricultural land will be completed in early January of 1996.

2. Easements

Montezuma National Wildlife Refuge has been designated as the Easement Manager when lands or easement restrictions on lands are conveyed to the Service for inclusion into the National Wildlife Refuge System by the Farmers' Home Administration (FmHA). Authority for the conveyance of interest in these properties lies in provisions of the 1985 and 1990 Farm Bills. Montezuma's responsibility includes approximately 75% of all FmHA easement properties in New York State. The Cortland, New York Fish and Wildlife

Enhancement (FWE) field office is responsible for recommending the conservation easement and assisting the Easement Manager in establishing administration over the easement property.

Montezuma National Wildlife Refuge is currently responsible for management of 75 conservation easement properties and four FmHA fee-title transfer properties. The 79 units are scattered across 22 counties and total over 1,214 hectares (3,000 acres). The easements range from .4 hectares (1 acre) in size to over 152 hectares (375 acres). The average easement is slightly larger than 16 hectares (40 acres).

During 1995, Refuge Biologist Gingrich completed site visits and annual inspections of all 79 FmHA properties under Montezuma's jurisdiction. Table C-1 provides a breakdown of costs associated with completing the 79 site visits. Table C-2 provides a summary, by county, of the 79 FmHA easement properties visited during 1995.

**Table C-1. SUMMARY OF COSTS ASSOCIATED WITH FmHA
CONSERVATION EASEMENT MONITORING - 1995**

Per Diem expenses for overnight trips to visit distant conservation easement sites.....	\$399.12
Vehicle miles driven to visit conservation easement sites (4144 miles x \$.25 per mile).....	\$1036.00
Total FmHA site visit/administration man-hours for GS-11 Refuge Biologist (312 hours x \$24.06/hour)....	\$7506.72
Cost of film and developing for photographic documentation of easement conditions.....	\$300.00
Miscellaneous expenses (office supplies, phone calls, etc.).....	<u>\$200.00</u>
Grand Total.....	\$9441.84

As noted in Table C-1, administration of the program and routine site visits consumed 312 hours of staff time. This represents a loss to the Refuge Biological program of fully 15% of the staff biologist's time. Completion of boundary posting on the 79 easements under Montezuma's jurisdiction in addition to routine annual inspections would require a full-time commitment from the Refuge Biologist!

Montezuma (as is the case with many other refuges with FmHA responsibilities) is underfunded and short-staffed. In order to implement meaningful management practices, or even continue periodic inspections, we desperately need a private lands biologist for the FmHA program. Active management on any of these properties is impossible without a commitment of funding and manpower commensurate with the scope of the workload.

Table C-2. SUMMARY OF 1995 FmHA SITE VISITS

<u>Property Name</u>	<u>County</u>	<u>Date Deed Recorded</u>	<u>Date Easement Inspected</u>
Lynch, James & Lola	Broome	--	9-21-95
Schuk, John	Broome	09-28-90	9-21-95
Drice, Wellington & Jane	Cayuga	--	7-06-95
Palmer, Fred	Cayuga	--	9-21-95
Marks, Jerry	Chemung	06-29-90	9-20-95
Breneman, Steven	Cortland	06-12-89	9-21-95
Brown, Roy	Cortland	--	9-21-95
Frink, Gary	Cortland	06-04-90	9-21-95
Neadom, Barry	Cortland	--	10-12-95
Reed, Howard	Cortland	01-08-90	9-21-95
Robbins, Douglas	Cortland	10-29-90	10-19-95
Schalck, George	Cortland	--	10-19-95
Titus, Peter	Cortland	10-29-90	10-12-95
Wildman, Clara	Cortland	07-09-90	9-21-95
Harrad, James	Fulton	06-27-90	9-28-95
Berlinger, Herman	Herkimer	04-22-90	9-28-95
Faville, Dain	Herkimer	05-12-95	9-28-95
Huxtable, David	Her/Otse	--	9-28-95
Avon, Richard	Jefferson	--	7-05-95
Babcock, Earl	Jefferson	03-19-90	6-08-95
Kostoroski, Thomas	Jefferson	08-09-94	6-07-95
Platt, Douglas	Jefferson	--	6-08-95
Thompson, Garth	Jefferson	--	7-05-95
Zehr, Glenn	Jefferson	01-04-90	6-08-95
Felshaw, Robert	Lewis	--	10-12-95
Hoskins, Thomas	Lewis	--	6-07-95
Larkin, Albert	Lewis	--	6-07-95
Larkin, Franklin	Lewis	--	6-07-95
Pooler, Matt	Lewis	--	6-07-95
*Roberts, David	Lewis	10-19-94	6-07-95
Brooks, Robert & Ellen	Madison	--	9-14-95
Clark, Thomas	Madison	01-30-90	9-14-95
DesJardins, Anna & Joseph	Madison	02-01-90	9-14-95
Mason, Harold	Mad/One	--	9-14-95
Snell, Fredrick	Madison	02-15-90	9-14-95
Tornatore, Adam	Madison	--	10-12-95
Watkins, Robert	Madison	06-01-89	6-07-95

<u>Property Name</u>	<u>County</u>	<u>Date Deed Recorded</u>	<u>Date Easement Inspected</u>
Ball, Bruce	Oneida	09-13-89	9-14-95
Voelxen, David	Oneida	07-02-90	9-14-95
Albert, Donald	Ontario	06-07-90	8-17-95
Bergstresser, Dennis	Ontario	06-07-90	8-17-95
Czadzeck, Roger	Ontario	06-07-90	6-23-95
Galens, Michael	Ont/Way	04-30-90	6-23-95
Hudson, Earl	Ont/Yat	06-24-90	8-17-95
Hy-Will Farms, Inc.	Ontario	07-17-90	8-17-95
McMillan, Gerald	Ontario	--	6-22-95
Detch, James	Orange	--	10-22-95
Brolewski, Genevieve	Otsego	10-27-89	9-28-95
Parise, Nicholas	Otsego	--	9-28-95
Tillotson, Earl	Otsego	12-27-90	9-28-95
Slagle, Norman	Saratoga	11-28-90	9-28-95
Fancher, Kenneth	Schenectady	11-30-90	9-28-95
Dubendorf, Mark & Carol	Seneca	07-07-89	8-17-95
Landis Family	Seneca	--	8-17-95
Fox, Darwin	Steuben	06-11-90	6-22-95
Lewis, Dana	Steuben	05-17-90	9-20-95
Monahan, John	Steuben	10-19-90	9-20-95
*MacDougall, Stanley	Steuben	--	6-22-95
*Davis, Thomas	St. Lawrence	--	7-06-95
Diragon, Daniel	St. Lawrence	01-27-95	9-27-95
Fellion, George	St. Lawrence	12-11-90	7-06-95
*Harris, Floyd	St. Lawrence	11-01-93	7-06-95
King, Beverly	St. Lawrence	10-07-94	7-06-95
LaRock, Ivan	St. Lawrence	10-26-90	7-06-95
Lawrence, Thomas	St. Lawrence	--	7-06-95
Moscari, Roy	St. Lawrence	--	9-27-95
Smithers, Richard	St. Lawrence	--	7-06-95
Voss, Robert	St. Lawrence	08-23-90	7-06-95
Tubbs Family	Tioga	12-05-89	9-20-95
Burch, Larry	Washington	06-26-90	9-27-95
Higgins, C.N.	Washington	02-01-90	9-27-95
Lynch, Jeremiah	Washington	04-16-90	9-27-95
Moore, Thomas	Washington	11-16-89	9-27-95

<u>Property Name</u>	<u>County</u>	<u>Date Deed Recorded</u>	<u>Date Easement Inspected</u>
Cornwell, James	Wayne	--	6-23-95
Durham, Lloyd	Wayne	12-29-89	6-23-95
Martin, Marvin	Wayne	--	6-23-95
Valcore, William	Wayne	11-29-89	6-23-95
Bogue, David	Yates	12-15-89	6-22-95
Bond, Theron & David	Yates	01-10-90	6-22-95

***Fee-Title transfer properties.**

D. PLANNING

2. Management Plans

The Hunting Plan was rewritten, submitted, and approved in 1995.

The refuge's Fire Dispatch Plan was revised and submitted to the Regional Fire Management Coordinator.

The following annual programs were prepared and approved during 1995:

1. Annual Hunting Program
2. Annual Fishing Program
3. Annual Trapping Program
4. Annual Water Management Program
5. Annual Pesticide/Chemical Use Program
6. Annual Reports for the refuge's Scientific Collector Permits.

3. Public Participation

On February 17, we hosted a very important meeting of experts regarding shorebird management issues on the refuge. Hocutt, Lamoy, and Gingrich met with Dr. Charles Smith (Cornell University DNR), Dr. Steve Kelling (Cornell University), Gerry Smith (The Nature Conservancy), Sharon Skelly (Rochester Birding Association), and Dave Odell (NYSDEC NOMOWET) regarding refuge water management access, public viewing opportunities, and proposed changes in shorebird management. We were very pleased that the wide-ranging meeting provided major insights and agreements. Steve Kelling, as regional editor for the statewide publication "Kingbird" will be instrumental in "selling" critics and allies on our directions re: shorebird management.

On March 5, Hocutt participated in a Sunday afternoon meeting of "FORUM", a group of business people and local leaders who formed the group to attack the many economic and environmental projects affecting Seneca County. In addition to their concerns about plutonium storage at the Seneca Army Depot, we also discussed Seneca Meadows, water level management in the Finger Lakes, and other issues. At their request, we agreed to continue our participation on behalf of the Service at their meetings.

On April 5, Hocutt addressed the 30-member Monroe County Environmental Management Council in Rochester, New York.

The meeting revolved around refuge management problems, lake levels, Seneca Meadows Landfill, and other issues.

On May 10th, Hocutt addressed the Town of Tyre (New York) Board of Supervisors regarding the recent acquisition of the 366-acre Foster Tract. The very helpful and friendly meeting went far toward increasing their understanding of revenue sharing and the concept of taxes based upon value as muckland. We advised them and the town's attorney that they would be in the loop on any and all future acquisitions in the Town of Tyre.

On August 28, Hocutt hosted an evening meeting at the Visitor Center of the Cayuga County Federation of Conservation Clubs. Hocutt gave a presentation to the group about upcoming refuge hunting seasons and also about activities of the Finger Lakes Ecology Association. Hocutt invited several members of the group to participate in waterfowl banding before the meeting. A great time was had by all.

On September 16, Hocutt met with June Summers, President of Genesee West Audubon Society, regarding opposition by area birders to "restrictions" placed upon them by the refuge. Some 25 bird internet messages about the same issue were provided by refuge supporters from Syracuse, Rochester, Ithaca, and other locations. By month's end, most of the flak had subsided and a strong wave began to surface that the refuge is "...not anti-birder, but solidly pro-bird...". Hocutt was scheduled in October to address all three Rochester area bird clubs where the original issue started.

On October 12, Hocutt spoke at Penn Yan, New York, about the on-going flooding/Finger Lakes lake level issue to the Finger Lakes Association. The Association represents business/tourism/ recreational leaders from a 13-county area. Hocutt was asked to elaborate upon threats to 6,000 acres of wetlands around Cayuga and Seneca Lakes, and the threats to lake food chains which would result if levels of either of these two largest lakes were to be lowered in winter below their 60-years old "rule curves". The Cross Lakes - Seneca River Association, and other downstream residents, who have built in the 34-mile long floodplain are exerting tremendous pressure upon the Canal Corporation of the New York State Thruway Authority to lower the two lakes. Our presentation was helpful in galvanizing new supporters for the Service and State positions in this issue.

4. Compliance with Environmental and Cultural Resource Mandates

On January 26, Biologist Gingrich assisted New York Field Office Biologist Anne Secord in conducting a Level II

Preacquisition Contaminants Survey on the Foster Tract (Tract 183). Soil samples were collected from three areas of the property and submitted to U.S. Fish and Wildlife Service laboratories for analysis of arsenic and selenium content.

A Section 7 Consultation was prepared by Biologist Gingrich and submitted to the Regional Office on February 8. The document was prepared at the request of Peter Nye, New York State's Endangered Species Coordinator, to address possible impacts on the refuge's two nesting bald eagle pairs resulting from our growing season drawdown of Tschache Pool.

Past experience has shown that abundant food resources would remain for the eagles during and after the drawdown. In the unlikely event that a food shortage developed, contingency plans were prepared to establish several eagle "feeding stations" within the birds' nesting territories. Road-killed deer carcasses or carp trapped from other refuge pools would be provided at such "feeding stations" as an emergency food source for the birds.

The Section 7 document was reviewed at the Regional level and approved as written.

5. Research and Investigation

1995 proved to be a very active year for research on the refuge. Work continued on two Research/Management Studies during the year and two new Research/Management Studies began during 1995. In addition, two graduate students from the State University of New York College of Environmental Science and Forestry in Syracuse initiated Master's research projects on the refuge this year.

Montezuma NR 95 - "Effects of Nest Box Visibility and Density on Wood Duck Productivity" (52550-23).

1995 marked the third year of Dr. Paul Sherman's (Cornell University) current Research Management Study, and the fifth year overall that he has worked with the wood duck nest box program on the refuge.

Dr. Sherman's initial study (Research/Management Study 52550-21 - Increasing the Nesting Productivity of Wood Ducks) demonstrated that when wood duck nest boxes are hidden in the woods near brood habitat, duck nesting is less frequent and more live ducklings are produced per egg laid than when the boxes are erected in open marshes. The purpose of the second stage of the study is to rigorously

examine which of two possible factors, low visibility or low density of nest boxes, is more important in causing the observed reductions in parasitism and increases in productivity.

While it is now clear that hiding boxes has a positive effect on wood duck productivity, questions have recently been raised in the scientific and wildlife communities about whether the results are due to reduced visibility of boxes (hiding boxes makes it difficult for potentially parasitic females to follow each other to active nests) or to reduced density of boxes (spreading nesting females out diminishes both competition for boxes and the social upheaval associated with forcing a normally solitary species to nest colonially). It is important to separate these factors when developing specific management recommendations. For example, it is a relatively simple matter to reduce the number of boxes in any area, if density alone is the critical factor. If visibility turns out to be the key factor, however, then boxes will have to be removed from open marshes and repositioned on isolated trees in the woods.

A brief description of the procedures used in the second phase of this on-going research project follow.

Wood duck nest boxes were erected in four configurations: 1) high visibility - high density; 2) high visibility - low density; 3) low visibility - high density; and 4) low visibility - low density. Boxes in the first and third treatments were erected in 1993; boxes in the second and fourth treatments have been in place for three years or more.

Each of the four treatments in this completely crossed design contains 30 boxes. All 120 boxes will be monitored over three breeding seasons (1993-95), and the following data will be recorded yearly for each box: use, clutch size, number of hatched and unhatched eggs, and use by other avian or mammalian species.

For data analysis, the boxes in each treatment will be subdivided into groups of 10. One group from each treatment will be randomly assigned to each of three blocks. Data from the three complete blocks will then be analyzed using a two-way ANOVA. Data from each year will be analyzed separately. At the end of the study period, data from different years will be combined for further analysis if there is no significant heterogeneity among years within blocks.

The 1994 nesting season results are illustrated on the accompanying graphs. In 1994, 228 more ducklings hatched

from the 121 experimental nest boxes than had hatched in 1993. Greater duckling production in 1994 was due primarily to greater egg hatchability overall, but especially among the low visibility boxes. On average, an egg laid in a low visibility box (i.e., treatments 3 and 4) was twice as likely to hatch as was an egg laid in a high visibility box (treatments 1 and 2). At least twice as many high visibility as low visibility boxes were parasitized, and three times as many eggs were left unhatched in high visibility boxes. Among the four treatments, low visibility, low density boxes (treatment 4) were the most productive (10.1 ducklings/box), and high visibility, high density boxes (treatment 2) were the least productive (1.2 ducklings/box). These results leave no doubt that parasitism can be reduced and productivity increased by erecting hidden wood duck nest boxes on trees near brood habitat.

In 1994, as in 1993, the most recently erected boxes (i.e., treatments 2 and 3) were less often used, and parasitized, than the boxes that had been in place longer (treatments 1 and 4). This is unfortunate, because it means that "box age" is still a confounding variable in the experiment. It may take another year (or two) for box use to equilibrate among the four treatment blocks. Until this occurs, results from ANOVA analyses will be spurious.

In both 1993 and 1994, nest box visibility was more important than density in affecting parasitism and productivity. In both years, in both the high and low density, low visibility boxes (treatments 3 and 4), minimum parasitism rates, numbers of eggs laid, and unhatched eggs per box were lower, and the proportion of eggs that hatched and duckling production per box were higher than in both the high and low density, high visibility boxes (treatments 1 and 2).

If results from the 1995 nesting season (which will not be available until the winter of 1996) show the same trends as the 1993 and 1994 data, the implication would be not only that wood ducks can be effectively managed by hiding groups of boxes in woodlands, but that even relatively small woodlots may be sufficient nesting habitat. "Non-traditional" box placement in circumscribed areas would boost productivity, while minimizing the time and effort necessary for checking and maintaining the boxes.

1994 Montezuma Wood Duck Data
(Density X Visibility Experiment)

15

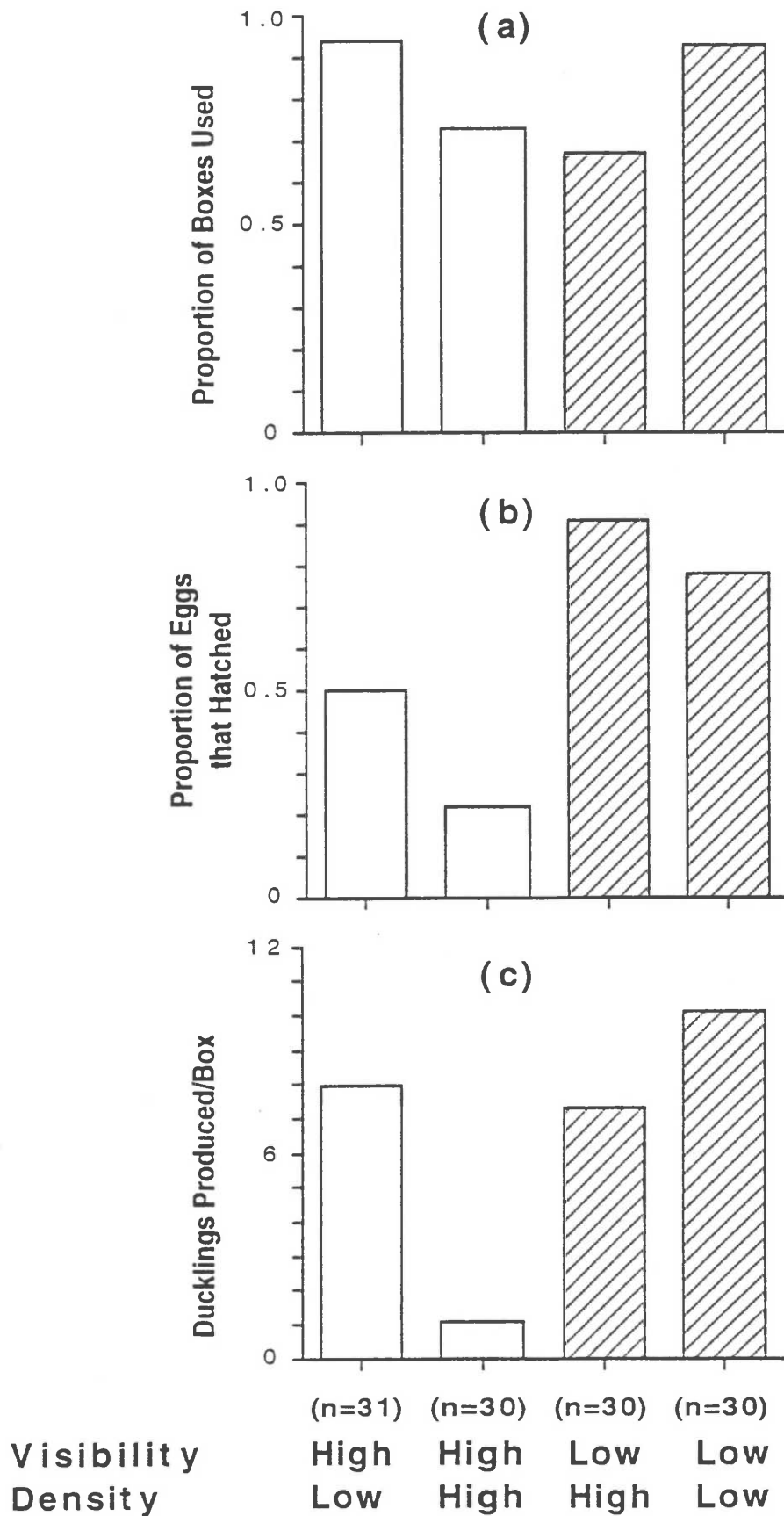


Figure 1

**1994 Montezuma Wood Duck Data
(Density X Visibility Experiment)**

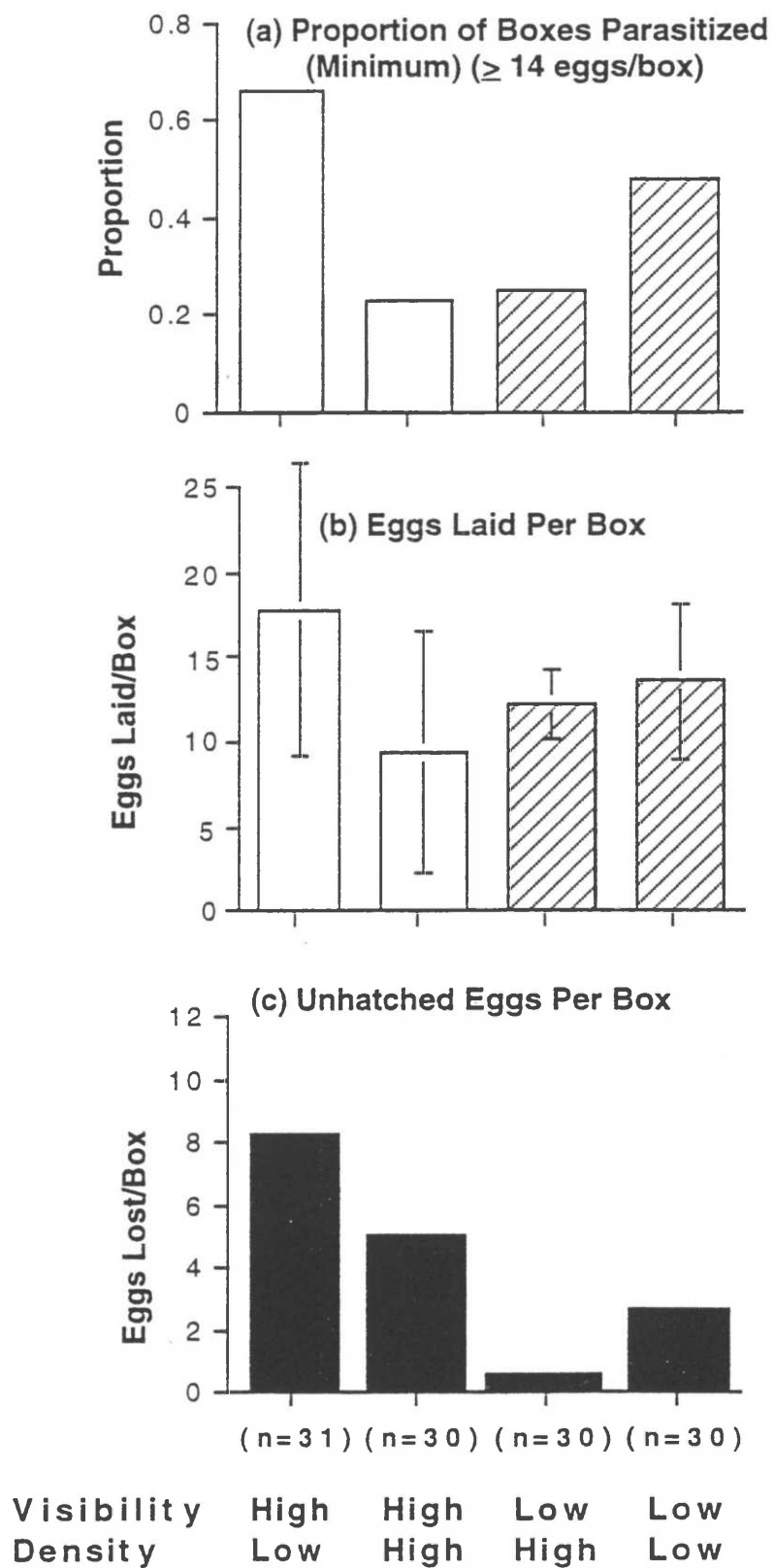


Figure 2

**Montezuma NR 95 - "Remote Sensing Methane Emissions
From Typha Wetlands" (52550-25).**

1995 was the last field season for this two-year research project. Dr. Michael A. Hardisky (Biology Department, University of Scranton) initiated this National Science Foundation funded project to: 1) Elucidate the mechanisms responsible for the transmission of methane from the substrate to the atmosphere; and 2) Evaluate, using satellite remote sensing, the emission of methane from the entire refuge.

Dr. Hardisky's study was not related to any specific refuge problem. However, considering the current national interest in monitoring the health of wetlands, his project will aid in developing techniques that will enable managers to assess the distribution and primary production of wetland vegetation. A short overview of the procedures used during the study follows.

Four areas were chosen from within the refuge to represent unique hydration regimes. These areas were monitored monthly for primary productivity of the macrophytes, pore water methane profiles, methane flux, below ground biomass distribution and productivity, and water table position. Biomass was harvested destructively from two replicate plots at each station and methane flux measurements were made using one cubic meter teflon chambers.

Stations were located within the refuge using GPS coordinates and related to satellite imagery. Analysis of the spectral components of the imagery was related to plant productivity and ultimately to methane emissions. Ground-based canopy spectral data was also gathered to assist in interpretation of the satellite imagery.

Dr. Hardisky's research project was conducted during both the 1994 and 1995 growing seasons (sampling period from May to September of each year) with a SPOT satellite image purchased of the refuge each year. A final report of the project will be provided to the refuge following completion of data analysis for the 1995 field season.

**Montezuma NR 95 - "Effects of Grassland Management
on Nongame Bird Community Structure and
Productivity" (52550-26).**

Populations of many grassland bird species in the eastern United States have declined since the 1960's. A study of

how current upland management practices affect nongame bird community structure and productivity was begun at Iroquois NWR by Dr. Chris Norment, SUNY-Brockport, in 1994. Expansion of the study in 1995 to include Montezuma NWR was undertaken to give the project a regional perspective and aid in the formulation of management recommendations.

A short overview of the procedures used during the study follows.

Avian community structure will be sampled with fixed-radius point counts in a range of upland habitats. Ten 50-meter radius circular plots will be established on Montezuma NWR. Habitat relationships will be quantified by: 1) small spatial scale-detailed vegetation analyses centered on point count stations; 2) Landscape scale-analyses of maps and aerial photos to obtain data on contiguous area of upland habitats, connectivity of landscape elements, etc. Data gathered from both small spatial scale and landscape scale will be used for univariate and multivariate analyses of relationships between habitat characteristics and bird species richness and abundance.

Dr. Norment's research project will be conducted during both 1995 and 1996 at Montezuma. A final report will be provided to the refuge following completion of the 1996 field work. The final report will provide baseline information on species and populations of nongame grassland birds at Montezuma. These data, plus data on bird/habitat relationships, will be used to make recommendations as to how best promote nongame grassland bird populations in upland habitats on the refuge.

Montezuma NR 95 - "Biological Control of Purple Loosestrife" (52550-27).

The late summer of 1995 saw the initiation of this very complex research project directed by Dr. Bernd Blossey (Biological Control of Non-Indigenous Plant Species Program) of Cornell University. Although initial releases of the root-feeding weevil Hylobius transversovittatus were accomplished during August of this year, 1996 will be the first true field season for this three-year research project.



Dr. Bernd Blossey "inoculating" purple loosestrife plants with eggs of the root-feeding weevil *Hylobius transversovittatus*. (95-1; AD)

Objectives of Dr. Blossey's project are to:

- 1) Identify the potential of three different insect herbivores (*Galerucella californiensis*, *Hylobius transversovittatus*, and *Nanophyes marmoratus*) or combinations of these species to control the wetland weed purple loosestrife (*Lythrum salicaria*).
- 2) Study the response of native vegetation to insect feeding on purple loosestrife.
- 3) Study the impact of a leaf feeder (*G. californiensis*) and a root feeder (*H. transversovittatus*) on suppression of purple loosestrife along a moisture gradient.

A complete description of Dr. Blossey's research project follows.

Purple loosestrife is an exotic wetland perennial introduced into North America in the early 19th century. Today this plant occurs in dense stands throughout the temperate part of the United States and Canada. Large monotypic stands of purple loosestrife reduce biotic diversity of infested wetlands by replacing native plant communities, thus eliminating food and cover essential to many wetland species, including waterfowl.

No effective method is available to control purple loosestrife, except where it occurs on small, localized stands and can be intensely managed. These control measures, however, are costly, require long-term maintenance, and in the case of herbicides, are non-selective and environmentally degrading.

Present efforts to control purple loosestrife focus on the release of host-specific phytophagous insects that were introduced from the plant's native range in Europe. Past studies have identified five species attacking the different plant parts; i.e. two leaf-feeding beetles (G. californiensis and G. pusilla), a root-feeding weevil (H. transversovittatus), and two flower and seed-feeding weevils (N. marmoratus and N. brevis). The insects selected as biological control agents are the primary force controlling the abundance of purple loosestrife in Europe where the plant is a minor component of wetland communities. Other plant species are not at risk because these insects are extremely host specific and feed exclusively on purple loosestrife. Introduced into the U.S. without their natural parasitoids and diseases, these insects are expected to reduce the abundance of purple loosestrife to about 10 percent of its current level over 90 percent of its range within the next 10 - 20 years.

During the last five years Dr. Blossey has studied the impact of each of the species on plant performance individually in a common garden, however, he does not know how combinations of the insects affect plant growth and survival in the field or under different moisture conditions. He also does not know how competition by other wetland plant species affects the success of purple loosestrife control by the biological control agents.

During the early phase of implementation of the biological control program, it is of crucial importance to insure that the control agents released do not interfere with each other and thereby potentially reduce the time needed to control purple loosestrife. The current research will identify the "best" agent or agent-combination for release. At the same time, the experiments will study the effects of competition by background vegetation on control success. Results of the current research will immediately affect recommendations concerning release strategies across the entire North American continent.

The research study will use a completely randomized full factorial design with the following treatments:

- a.) root herbivory by H. transversovittatus;
- b.) leaf herbivory by G. californiensis;

- c.) flower herbivory by N. marmoratus; and
- d.) plant competition.

The experimental design will use 60 walk-in field cages (3.2 by 3.2 by 1.6 meters) large enough to allow walking and repeated collections. Edge effects will be minimized and cages will be placed to maintain a representative sample of background vegetation. The experiment is scheduled to cover three years (1996 - 1998) with all treatments replicated four times.

The following parameters will be measured throughout the course of the research effort:

- a.) purple loosestrife - number of plants, % cover, number of stems, stem height, number of shoot tips, number of inflorescences, length of inflorescences, number of flower buds, biomass, and number of seedlings.
- b.) other plant species - number of each species, % cover, number of stems/species, height, biomass, and number of seedlings.
- c.) H. transversovittatus - number of adults, number of eggs/ovipositions, and amount of feeding damage.
- d.) G. californiensis - number of adults, number of eggs/larvae, number of attacked shoot tips, and amount of feeding damage.
- e.) N. marmoratus - number of adults, number of eggs/larvae/pupae, and amount of feeding damage.

In addition to the four Research/Management Studies occurring on the refuge during 1995, two graduate students from the State University of New York College of Environmental Science and Forestry in Syracuse conducted Master's research projects on the refuge this year.

A.) Wildlife and Vegetation Response to Wetland Restoration on Mucklands in Central New York.

This two-year research project is being conducted by Master's candidate Sheila E. Sleggs under the guidance of Dr. Larry W. VanDruff. A short description and objectives for the study are as follows.

The viability of mitigation as a means of wetland policy and protection is questioned by wetland scientists, managers, and developers. Standard success criteria and long-term monitoring necessary to evaluate wetland mitigation is often lacking. One specific issue is how off-site mitigation compares with natural wetland areas in providing suitable habitat for wildlife and vegetation communities. To address these issues the researcher proposes to evaluate wildlife and vegetation communities on mitigation sites and natural wetland areas for the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Fish and Wildlife Service. The research project will investigate methodologies for a long-term monitoring program to evaluate the response of wildlife and vegetation communities to restored muck wetlands in the Montezuma Marsh complex of central New York. The project will not only enable the NYSDEC and USFWS to conduct long-term monitoring but also provide baseline data and success criteria to evaluate the viability of off-site mitigation for providing suitable habitat for wetland wildlife and vegetation.

The goal of the study is to characterize wildlife and vegetation communities on restored and natural wetland habitats to provide success criteria and standards by which to evaluate restored muck wetlands in the Northern Montezuma Wetlands Complex. The study includes the following objectives:

- 1.) Determine the avian, reptilian, amphibian, and vegetation composition on four restored sites in comparison to four natural sites within the same geographic region and wetland type.
- 2.) Analyze spatial and temporal (2-year period) trends in wildlife and vegetation response to wetland restoration.
- 3.) Develop efficient and standardized methods of assessing the response of wildlife and vegetation communities to restored wetland habitat in the Northern Montezuma Wetlands Complex.
- 4.) Provide wetland managers and restorationists with a protocol for evaluating muck wetlands restored to provide habitat for wetland wildlife and vegetation species.

The progress report for this ongoing research study included the following discussion section following the 1995 field season.

Testing and evaluating the chosen censusing methods for vegetation and wildlife communities required consideration of both scientific validity as well as economic feasibility. These two issues become more and more important as time and money become tighter for government offices such as the NYSDEC and the USFWS. Finding techniques that will not only sufficiently characterize restored wetland areas in terms of wildlife and vegetation, but also be logistically reasonable for a long-term monitoring program requires careful review, creativity, and foresight.

With the above considerations in mind, the researchers believe that many of the methods tested, though effective, are too involved for a long-term monitoring program to be executed by the NYSDEC. Methods similar in their effectiveness to the tested methods, but with less time requirements are currently being incorporated into an inclusive protocol to be tested during summer, 1996. Upon review and acceptance of this protocol, it will be implemented for a long-term monitoring program for all wetland restoration sites within the Northern Montezuma Project Area.

Censusing will resume using the above methods starting in March, 1996. Methods for the monitoring protocol will be tested separately on the four restoration sites beginning in June, 1996. All 1995 data has been entered into a database, and data analysis as described above will commence using the SAS statistical program.

B.) The Effect of Flooding on Breeding Birds and Forest Structure in a Greentree Reservoir 18 Years After Flooding Cessation.

This research project is being conducted by Master's candidate Amy Deller under the guidance of Dr. Guy A. Baldassarre. A short description and objectives for the study are as follows.

The Unit 17 area on the Montezuma National Wildlife Refuge has been managed as a greentree reservoir (GTR) in the past and provides several unique opportunities for research. The area has a long history of research projects on waterfowl, mammals, invertebrates, and vegetation. Unit 17 also has a design that facilitates research.

Specifically, a 486 hectare (1200 acre) forested wetland is divided north and south by New York State Route 5/20. The 243 hectare (600 acre) tract north of the road remains in its natural state as a forested wetland and serves as a

control. The 243 hectare (600 acre) stand south of the road was ditched and diked to create two 121.5 hectare (300 acre) impoundments separated by a north-south dike. Unit 17 is also unique as a GTR because it has not been flooded artificially for 18 years, but will be reflooded in 1996.

Objectives for the study are:

- 1.) To compare the changes in vegetation composition, biomass, and age structure of trees in a GTR in response to managed flooding after 18 years of natural flooding.
- 2.) To compare the vegetation composition, biomass, and age structure of trees in a GTR after various management cycles with a natural forested wetland.
- 3.) To determine the changes in tree growth between years of natural flooding and managed flooding.
- 4.) To determine the mortality and growth of tree seedlings after one year of managed flooding compared to natural flooding.
- 5.) To compare the response of breeding birds to one year of managed flooding after 18 years of natural flooding.

Two field seasons will be used to sample the vegetation and breeding birds in both the GTR and the control area. During 1995 data was collected to evaluate vegetational changes after 18 years of natural flooding. One pool (the east impoundment) will be flooded in the spring of 1996. Vegetation and breeding bird surveys will be repeated in 1996 to compare to 1995 and historic data to determine changes after different management cycles. Flooding of the east pool will provide important information concerning the future management of the Unit 17 area of the refuge. The objectives of flooding the east pool are:

- 1.) To determine the changes in vegetation due to flooding.
- 2.) To determine the response of breeding birds to flooding.
- 3.) To evaluate if a spring flood can be manipulated but not negatively influence tree regeneration.

These results will provide information on GTR management relative to impacts on waterfowl, biodiversity, and forest succession which will enhance management programs at Montezuma National Wildlife Refuge as well as other refuges in the Northeast.

E. ADMINISTRATION



Front Row (L to R): 6, 4, 9, 5, 8
 Back Row (L to R): 1, 7, 2, 3 (95-2; MJN)

PERSONNEL

1. Grady E. Hocutt.....Refuge Manager, GM-13, PFT
2. Robert E. Lamoy.....Deputy Refuge Manager, GS-12, PFT
3. Tracy A. Gingrich.....Refuge Biologist, GS-11, PFT
4. Marva K. Smith...Outdoor Recreation Planner, GS-09, PFT
5. Judith A. McMahon.....Fiscal Assistant, GS-06, PFT
6. Nancy J. Estes.....Clerk/Typist, GS-03, PPT
7. Steven L. Flanders.....Maintenance Mechanic, WG-10, PFT
8. Melvin J. Norsen.....Maintenance Mechanic, WG-09, PFT
9. Louise K. Dates.....Tractor Operator, WG-05, TFT
 (Term appointment 10/16/94 - 10/15/98)

4. Volunteer Program

Montezuma's volunteers again proved to be the difference in the refuge doing its job and doing an excellent job. Twenty five volunteers provided 4,499 hours (\$51,738.50) of service to the refuge during FY 95.

Information on volunteer contributions by category was as follows:

Maintenance	399 hours	\$ 4,588.50
Resource Support	1,348 hours	\$15,502.00
Public Use	2,556 hours	\$29,394.00
Administration	196 hours	\$ 2,254.00

Several college interns and graduate students worked at the refuge during 1995, including:

<u>Name</u>	<u>Academic Affiliations/Class</u>	<u>Work Project</u>
Steven Kahl	SUNY-ESF Undergraduate Intern	Breeding Bird Surveys
Alison Donofrio	Univ. of Rochester Undergraduate Intern	Raptor Observations
Dawn Friedberg	SUNY-ESF Undergraduate Intern	Shorebird Surveys
Carol Clark	Hobart-William Smith Undergraduate Intern	Public Use
Maiken Holmes	SUNY-ESF Undergraduate Intern	Public Use
Sheila Sleggs	SUNY-ESF Graduate Student	Thesis Research- Herptofauna
Amy Deller	SUNY-ESF Graduate Student	Thesis Research- Flora/Fauna Changes in Unit 17

The above group of interns provided 1,592 hours of service to the refuge.

Refuge volunteers accomplished or assisted with the following tasks:

- Operated the Visitor Center 7 days a week from April 1 to December 1.
- Led 24 guided bird or wildflower tours of the refuge for a total of 697 people.
- Maintenance of Esker Brook Trail.
- Produced information sheets on refuge management programs (i.e. pool drawdown).
- Presented educational/informational programs to various groups.
- Developed interpretive exhibits.
- Operated Hunter Check Station.
- Conducted wildlife surveys.
- Processed news releases.
- Nest monitoring.
- Lawn mowing, landscaping.
- Vehicle maintenance.
- Staining of refuge buildings.
- Assisted with refuge waterfowl banding program.
- Bluebird box management.

It is obvious that the volunteer program is vital to the successful operation of the refuge. We are lucky to have such a dedicated volunteer staff.

Refuge volunteers who have provided the refuge with 1000+ hours of service over the years:

Grace Schaffer (1990) = 2,613 hours
 Edward Klein (1990) = 1,117 hours
 Yvonne Klein (1990) = 1,026 hours
 Kevin Holcomb (1991) = 1,563 hours
 Barb Olds (1988) = 1,103 hours

Refuge volunteers reaching milestones during FY 95.

Larue St. Claire - 500 hour pin
 Ann Foland - 250 hour pin
 Ed Klein - 1,000 hour pin
 Polly Keating - 250 hour pin
 Steve Kahl - 250 and 500 hour pins
 Maiken Holmes - 250 hour pin
 Alison Donofrio - 250 hour pin

Refuge volunteers went on their first-ever group trip on June 24, 1995. We spent the day at Iroquois NWR. The Iroquois staff and volunteers gave us a refuge tour. Everyone brought a dish to pass and we spent the afternoon feasting and socializing. Montezuma's volunteers would love to host the Iroquois volunteers in the future.



The volunteers of Montezuma and Iroquois National Wildlife Refuges. (95-3; TAG)

On July 6, ORP Smith, Volunteer Kevin Holcomb, and Interns Maiken Holmes and Alison Donofrio assisted with a goose drive at the Wilson Hill Wildlife Management Area. Approximately 1,200 geese were caught, but severe lightening later in the day forced the release of approximately 300 birds.

Montezuma's staff and volunteers worked for weeks in humid weather preparing the refuge for Secretary Babbitt's visit on August 10, 1995. We all wanted the refuge to "shine" and we hoped the Secretary would be as proud of Montezuma as we are. We were able to weed and mulch the entire Headquarter/Visitor Center area, trim vegetation along the Wildlife Drive, and wash and polish everything (including vehicles, buildings, exhibits and signs).

Volunteer Ann Foland rounded up her son's friends to discuss endangered species with the Secretary. During his visit, volunteers took care of the following tasks: parking cars and providing directions, photographing the event, and transportation of the kids and media to designated areas.

We all were able to relax and breath easier once the Secretary was on his way to the airport. We celebrated our hard work and the success of the event with a potluck lunch in the Visitor Center. The refuge would have never been able to get all the work done without our volunteer staff.

5. Funding

	<u>FY 1991</u>	<u>FY 1992</u>	<u>FY 1993</u>	<u>FY 1994</u>	<u>FY 1995</u>
1261 & 1262 - O & M; ARMM; Resource Prob.	\$612,146	\$486,406	\$613,609	\$525,905	\$504,723
4960 - Entrance Fee O & M	0	0	0	0	2,857
6860 - Expense For Sales	2,000	2,000	2,000	2,000	2,000
8610 - Quarters Rehab.	5,741	5,700	0	0	4,886
7208 - Challenge Grant	0	0	3,700	0	0
1261 - YCC	16,665	16,732	16,666	16,668	0
9120 - Fire	2,500	500	500	500	1,800
1230 - Wetlands Restoration	20,240	2,785	0	0	0
TOTAL	<u>\$659,292</u>	<u>\$514,123</u>	<u>\$636,475</u>	<u>\$545,073</u>	<u>\$516,266</u>

O & M Funding included:

- \$1,800.00 for a new winch
- \$4,000.00 for phragmites control
- \$500.00 for the refuge's Volunteer Program
- \$500.00 for NUS/fire supplies

6. Safety

Several safety meetings were held through the year. Videos were shown on topics including technology and driving, power tools, safety in public places, and personal protective equipment.

All staff and several volunteers attended a six-hour Defensive Driving Course at the Visitor Center on February 14. The course was presented by the National Safety Council. The course meets the requirements of 24 AM, and was interesting and informative.

In addition to the more formal meetings and training, frequent tailgate meetings and on-the-spot safety sessions were held prior to starting various field work projects. These impromptu sessions are extremely valuable in that potential safety problems are discussed and logistics are worked out immediately before undertaking the task.

No lost-time accidents occurred in FY 1995.

An unplanned expenditure of \$1,321.00 was necessitated in August when someone dumped a small load of furnace duct work, which appeared to contain asbestos, adjacent to a refuge parking area at May's Point. Upstate Environmental Services of Syracuse was contracted for removal. The irony of this situation (or so we were told by the removal company) is that small quantities of this material can legally be considered household trash and discarded by the typical homeowner with other household waste. This would have cost the original owner nearly nothing.

7. Technical Assistance

Secretarial Visit

As part of a tour across New York State, Interior Secretary Bruce Babbitt visited Montezuma National Wildlife Refuge on August 10, 1995. The purpose of the tour was to promote the Clean Water Act, the Endangered Species Act, and other environmental regulations. The primary focus of the Montezuma visit was the success of the bald eagle re-introduction at the refuge and across the State. A secondary focus was the participation of partners in all of our activities.

The Secretary concluded his presentation in Rochester, New York on August 9 in mid-afternoon. We were fortunate that he checked into his room in nearby Auburn and came to the refuge at 6:30 p.m. The Secretary was accompanied by his Security Chief, two Aides, and a reporter from the Austin, Texas Free Press. Hocutt and Lamoy were able to provide an excellent airboat tour and brief on-ground tour. The weather was excellent and the birds cooperated as though on cue. The Secretary had a thoroughly enjoyable time. During the tours we interpreted management practices and discussed issues. This dialogue continued over dinner at the nearby Deershead Inn.

On August 10, the Visitor Center was the site of the main event. Secretary Babbitt arrived about 9:00 a.m., and went into a closed round-table discussion in the Visitor Center. About 18 hand-picked representatives (neighbors, farmers, birders, DU, TNC, DEC, sportsmen, and academia) had an open, uninhibited dialogue with the Secretary to permit a better understanding of local interests and concerns. Remarks ran the gamut from the closure of Oyster Bay NWR to hunting, to blackbird damage, to full-payment of Revenue Sharing, to praise for shorebird management, and to praise of the refuge staff for cooperation with highly diverse local interest groups.

At about 9:30 a.m., Secretary Babbitt was welcomed by Refuge Manager Hocutt outside the Visitor Center in front of a crowd numbering well over 100. The Secretary carried a bald eagle on his left arm during his opening remarks. He then conducted an environmental education dialogue with a small group of children in front of the crowd.

A small group of Greenpeace members caused a minor disturbance by approaching the crowd dressed in contaminant suits waving placards and chanting. According to prior instructions of the one-man Park Police security detail, the group was silenced and dispersed as quickly and quietly as possible by Hocutt and Lamoy.

A brief news conference, well covered by local television, radio, and print media followed.

At about 10:45 a.m. the Secretary boarded the airboat with a group of the children and was given a brief ride (photo-op) to the banding site, where he departed about 11:00 a.m.

As a result of her superb work in organizing all the little details for the Secretary's visit, ORP Marva Smith was presented with an On-The-Spot Award on August 14 by ARD-RW Don Young.



Secretary Babbitt, refuge staff, and the school children that participated in the Secretary's program. (95-4; KC)



Secretary Babbitt discussing endangered species with some students. (95-5; KC)



Secretary Babbitt holding "Liberty", a non-releasable bald eagle. (95-6; KC)



After Secretary Babbitt's speech, Liberty's handler, Paul Schnell, gave the students an up-close view of the bald eagle. (95-7; KC)



Secretary Babbitt took time to answer individuals' questions while visiting Montezuma. (95-8; KC)



Once the coast was clear (Secretary Babbitt was on his way to the airport), refuge staff and volunteers were able to relax and enjoy lunch. (95-9; MM)

On March 28, Deputy Manager Lamoy and Biologist Gingrich provided assistance to New York State Department of Environmental Conservation Region 7 personnel with a prescribed burn on approximately 12 acres of state-owned land near the town of Savannah. No problems were encountered during the burn, and the state personnel accomplished their objective of killing encroaching woody vegetation within the grassland/cattail unit.

Biologist Gingrich attended the Finger Lakes Initiative meeting at the Cortland Ecological Services Office on March 9. The meeting was devoted to Endangered Species issues within the Finger Lakes Basin and reauthorization of the Endangered Species Act at the national level.

Biologist Gingrich met and provided a tour on March 9 for Valanne Glooschenko, National Biological Services, Atlanta, Georgia, and Biologist Diane Mann-Kleger (ES-Cortland). The topic of discussion was BEST, but we also touched on Seneca Meadows Landfill and purple loosestrife management.

On April 12, the refuge hosted the officers and steering committee of the American Wildlife Research Foundation. The group plans a large statewide/regional conference on "Wetlands -- For Wildlife And People" in August, 1996. AWRF

has been in existence for almost 100 years, and has made significant impacts in regional wildlife issues. Officers are university people, NYSDEC staffers, and statewide leaders of sportsmen's and conservation groups. The 1996 meeting will focus upon the Northern Montezuma Expansion Project. Hocutt, Lamoy, and Gingrich participated in the meeting. During 1995, Hocutt and Lamoy participated in five additional day-long meetings of AWRP at the refuge and the State University of New York College of Environmental Science and Forestry at Syracuse.

On April 19-21, Hocutt participated in the "Criteria Setting" meeting of Great Swamp NWR. He also spent an afternoon with Co-op graduate student Jackie Record to survey her study sites for her masters' thesis from the State University of New York College of Environmental Science and Forestry at Syracuse. Hocutt sits as a formal member of her graduate committee.

On May 5th, Hocutt met at the refuge with John Zmarthie, Canals Engineer, New York State Thruway Authority, to discuss F.L.E.A., the canals' "operating rule curves", water management issues on the refuge, the canal (Seneca and Clyde Rivers), and Cayuga Lake. The meeting was very helpful. A decided benefit of our long-term working relationship with Zmarthie is that we are in a position to deflect criticism of the Canal Corporation by fishermen and hunters.

On May 11, Hocutt, Lamoy, and Gingrich met with Carl Melberg at the Syracuse Airport and travelled to Madison County to inspect a parcel of land for possible inclusion in the National Wildlife Refuge System. The owner, Mike Patne, is a personal friend of Congressman James Walsh. The land is a combination of active and abandoned muckland. Restoration work has been accomplished on some parcels through the Partners For Wildlife program. Mr. Patne has some ideas of what he would like to see, including an idea of staff size with the "Directorship" reserved for himself. With some further defining and refining of his idea, the project could have some merit.

On May 16th, Hocutt sat as a member of the graduate committee for Jackie Record at the State University of New York College of Environmental Science and Forestry in Syracuse. Other committee members included Dr. Ranier Brock (Chair), Dr. Robert Chambers, and Dr. Guy Baldassarre. Director of Jackie's defense was Dr. Ellen Demming. Jackie presented an excellent seminar of her study at Great Swamp NWR to faculty and students from 12:00 p.m. to 1:00 p.m. Her thesis defense and oral exam occurred from 1:00 p.m. to 3:00 p.m., and she came through with flying colors. Congratulations, Jackie!

The refuge hosted a Pre-Retirement Seminar at the Visitor Center on June 6 and 7. A total of 31 area FWS employees and spouses attended. The training was very good. The session was organized by Office Assistant McMahon. Several participants and trainers contacted various refuge staff to comment on the excellent job Judy had done in organizing the session. For her outstanding effort, Judy was given an On-The-Spot award.

On June 8, Hocutt hosted Ms. Alberta Bennett, Chairman of the Seneca County Industrial Development Agency. The lake level issue and its economic and tourism ramifications were discussed at length, as was Hocutt's commitment to the Seneca County Chamber of Commerce to provide technical advice for the Chamber's new County Welcome Center. Hocutt took Ms. Bennett on a tour of the refuge.

On June 9, Hocutt hosted Ms. June Summers, President of the Genesee West Audubon group (Rochester). She is also the metro-Rochester (three birding groups) contact with the New York State Federation of Bird Clubs. Hocutt assisted Ms. Summers with a draft position paper regarding lake levels for all central and western New York groups as well as the statewide body.

The Visitor Center was the site of an American Wildlife Research Foundation planning meeting on June 13. ORP Smith made all the arrangements for this meeting, working closely with Dr. Robert Chambers (SUNY-ESF). Following the business meeting and working lunch, the group toured the refuge and portions of the Northern Montezuma Project. This tour, provided by Lamoy and DEC Biological Technician Paul Hess, was a trial run for a much larger tour to be held in August, 1996, when the AWRF will host a major three-day meeting in nearby Waterloo.

On July 6, ORP Smith, Volunteer Kevin Holcomb, and Interns Maiken Holmes and Alison Donofrio assisted with a goose drive at NYSDEC's Wilson Hill Wildlife Management Area. Approximately 1,200 geese were caught, but severe lightening later in the day forced the release of approximately 300 birds.

On July 10, NYSDEC (R7) Biologist Bob Grody came to the refuge and visited with Hocutt and Lamoy about the State's plan to reintroduce the river otter to central New York State. Topics discussed included education, refuge trapping programs, and other cooperative efforts.

On July 26, Hocutt, Lamoy, and Norsen accompanied Carl Melberg (Ascertainment Biologist, RO), John Hickey (Contaminants, New York Field Office), and Dave Odell and Bruce Penrod (NYSDEC) to Seneca Army Depot in nearby

Romulus. The army base is being closed, and was being inspected for future consideration as part of the refuge system or other wildlife use.

The 10,000-acre installation has about 8,500 - 9,000 acres of early successional growth. Small fields and mowed strips had been maintained among small, mostly young, woodlots and brushy areas. The fenced area supports a herd of white-tailed deer, many of which are white or pie-bald. Other wildlife includes turkey, grouse, rabbits, and beaver. Several red-tailed hawks, several turkey vultures, a Cooper's hawk, and a kestrel were sighted. Woodcock use the fields, strips and shrub growth. The area has several small wetlands including a 90-acre man-made pond which is the tertiary treatment site for the installation's sewerage system.

The installation is not without its problems. The entire base has recently been put on the EPA's list of Superfund sites. There are several known areas of contamination, including radioactive contamination. There are 519 bunkers located within the central 2/3 of the fenced installation. A total of 139 miles of black-topped roads traverse the area. The base currently supplies water and sewerage treatment for parts of the Town of Romulus.

The site is also currently being studied as a future site for storage of plutonium pods.

The Cayuga Nation of the Iroquois Confederacy may be interested in the installation.

On July 31, Hocutt did a 30-minute taped interview with Margaret Barker, Outreach Coordinator for the Cornell University Laboratory of Ornithology. The topic, Wetland Values and Outreach Considerations, will be the subject of a paper Barker is writing. Hocutt also took Barker on an airboat and vehicular tour of the refuge.

On August 14 and 15, ARD-RW Don Young, Refuges-North Supervisor Don Frickie, and Biologists Walt Quist and Carl Melberg accompanied Hocutt, Lamoy, and Gingrich to Seneca Army Depot for a second site visit and tour. The bus tour was much more extensive than the July visit. Following the tour, the group met in the refuge office to discuss the tour, the problems with the base, the potential for management, and any other issues we could think of. The meeting continued on August 15. All agreed that at this time the base has some habitat that could be valuable, but it's best use may be as a State Wildlife Management Area. We did draw a boundary line on the map in case the State does not want the base. However, subsequent communications

with State personnel indicate they are actively pursuing the base as a Wildlife Management Area.



The RO visits the field! ARD Don Young, Refuge-Central Supervisor Don Frickie, and Realty's Walt Quist join Hocutt and Lamoy on a site visit to Seneca Army Depot. (95-10; TAG)

On August 18, Special Agents Gale and Garabedian and Refuge Officer Gerhart were re-qualified (handgun and shotgun) by Firearms Instructor Lamoy at the Ontario County Sheriff's Range.

On October 4, Gingrich hosted at the refuge and participated in a videotaped interview on purple loosestrife management. The video, scheduled for release in July of 1996, details the concerns of wildlife managers regarding purple loosestrife encroachment in wetland habitats. A major theme of the video is the introduction of bio-control agents to control purple loosestrife. Other participants in the videotaping session were Dan Carrol (NYSDEC Region 8 Biologist) and Dr. Bernd Blossey (New York Cooperative Fish and Wildlife Research Unit - Cornell University).

8. Other Items

Seneca Meadows Landfill

1995 was an exceedingly active and important year in the refuge's on-going involvement with the permitting, operation, and regulation of the Seneca Meadows Landfill (SMI). SMI is now a major regional landfill that first began operations in 1956. It is located some seven miles upstream of the refuge, and the landfill is bisected by Black Brook, a major refuge water source. Seneca Meadows is New York State's second largest landfill (after Fresh Kill, downstate). SMI landfills 860,000 tons of waste annually. The landfill also contains a 90-acre Phase II Superfund Site (approximately 600,000 tons of toxic and hazardous waste), and a 20-acre, inactive hazardous waste site.

The interest of the Service is in surface water and sediment quality in Black Brook itself. Two scenarios mark the most likely impacts of the landfill upon the refuge. The first would be subtle -- migration of contaminants from the landfill (over time, and most likely after closure), where they would become tied up in sediments and flushed downstream into the refuge during major precipitation events. The stream is almost 90% channelized. The second scenario would be a catastrophic event such as a slope or dike failure (again, most likely after closure).

Consequently, the Service has been a major player for over 15 years in the effort of NYSDEC to permit and regulate SMI. It was Service intervention in 1980 that was primarily responsible for the escrow account for closure/post closure, the 20-year period of responsibility after closure; the sophisticated monitoring of surface water and sediment in Black Brook, and a number of other "firsts" for New York State. This was done because we never deviated (with SMI, NYSDEC, media, and support groups) from the position that SMI was "different" from all other landfills in the state because it has a major National Wildlife Refuge just downstream.

1995 was different from other years because SMI introduced the concept of a major two-pronged expansion, which, when combined, would allow them to operate for another 19 years. The first phase was to be a vertical expansion of approximately 110 feet to bring up to grade an area of some 45 acres of the now-closed inactive hazardous waste "A/B" Site. This would provide another eight years of landfill space. A corollary proposal is a new site adjacent to the current landfill. The latter expansion is called the "Southwestern Landfill", and would provide approximately nine years of landfill space.

Consequently, the Service became embroiled in the expansion proposal in late 1994 and very early 1995 when landfill owners and engineers began a lengthy series of meetings with refuge staff. Refuge Manager Hocutt again reactivated his scientific advisory team, which included Bill Kappel, a Senior Hydrologist with the U.S. Geological Survey in Ithaca, New York; Dr. Ron Scrudato, Director of the Research Center at the State University of New York at Oswego; and Dr. Robert Seem, Associate Director of the Geneva Agricultural Experiment Station of Cornell University. Hocutt began regular meetings with the advisors about the expansion proposals.

The issue of expansion was further complicated when NYSDEC approved a contract between SMI and Onondaga County (Syracuse) to allow 86,000 tons of incinerator residue from the County to be landfilled at SMI. Additionally, SMI petitioned DEC to change the Inactive Hazardous Classification of "A/B" to a lower classification.

The following is a summary of important events of 1995 with regard to the SMI issue.

- Hocutt, DRM Lamoy, and USGS's Kappel met early on January 18, 1995, to work out details for an afternoon meeting with NYSDEC Region 8 Solid Waste Chief Dan David and NYSDEC Project Engineer for SMI John Swanson. We introduced the concept of requiring SMI to construct 50-60 acres of wetlands as final "polishing" ponds for landfill surface water. We also proposed relocation of the Brook to the north side of the existing landfill. It was our decision to attempt to isolate the Brook from the landfill.
- On January 19, Hocutt did a lengthy, on-camera interview with WIXT-TV (ABC affiliate) in Syracuse to discuss Service concerns about incinerator residue, and possible effects of SMI upon refuge food chains. The piece ran that evening, and again on the next Sunday.
- On January 24, Hocutt addressed the Cayuga County Environmental Management Council in Auburn, New York, about Service concerns and possible impacts of incinerator residue, as well as impacts from a proposed 119-acre expansion.
- On February 1, Hocutt met with New York State Field Supervisor Sherry Morgan and David Stillwell (Cortland ES) at the refuge for four hours in the morning to discuss SMI and our tentative proposals to isolate (or relocate!) the brook around the site instead of it's current course through the middle. Provided a tour around the landfill and Black Brook.

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- Also on February 1, Hocutt met for several hours with John Battaglia, Chief Operating Officer/Principal Engineer for SMI, where he outlined five concept plans designed to ameliorate the refuge's concerns about surface water management and about lateral movement of leachate from the landfill, through near-surface water strata in the glacial till, and eventually into the brook.
- On February 7, assisted Graduate Students Jason Hines and Carolyn Coyle with 15 years of SMI background data for a public policy seminar at the State University of New York College of Environmental Science and Forestry at Syracuse.
- On February 15, Hocutt met for four hours with SMI's John Battaglia to refine the concept plans that the landfill had presented to the refuge. The changes were based upon numerous telecon sessions with USGS Hydrologist Bill Kappel and SUNY/Oswego Research Center Director Dr. Ron Scrudato.
- On February 25, Hocutt met with John Swanson, NYSDEC Region 8 Supervisory Project Engineer in charge of SMI, to discuss SMI proposals to the refuge and to ensure that no portion of their offers would interfere with NYSDEC's regulatory authorities over SMI.
- On March 1, Landfill Senior Vice President John Battaglia presented five "concept plans" to Hocutt which were designed to further hydrologically isolate Black Brook from the landfill (and visa versa).
- On March 2, Hocutt and Lamoy met in Ithaca, New York, at the U.S. Geological Survey office with Senior Hydrologist Bill Kappel and new Sub-District Chief Ed Bugliosi. The meeting entailed lengthy discussions of FWS strategies to take parts of SMI's five concept plans and meld them into a position paper that would satisfy our criteria for the protection of sediment and water quality in Black Brook.
- On March 3, Hocutt spent much of the day with NYSDEC Region 8 Solid Waste Engineer John Swanson. The meeting was to discuss recent proposals by SMI to the refuge, and to ensure that Service interactions with SMI were fully harmonious with NYSDEC's position as the regulatory authority. Agreement was reached on a number of issues regarding isolation of the brook, monitoring, and other issues.
- On March 7, Hocutt and Lamoy met at the refuge regarding SMI's proposals with USGS Hydrologist Bill

Kappel, Dr. Ron Scrudato (Director of the Research Center at the State University of New York at Oswego), and Dr. Robert Seem (Associate Director of Cornell University's New York State Agricultural Experiment Station, Geneva, New York). After discussion of SMI's five concept plans, we synthesized their materials into a FWS package and also added our own elements into the mix. The "package" included lining the brook, construction of wetlands to "final polish" surface water, and a number of other suggestions.

- On March 14, Hocutt and Lamoy met at the landfill, along with Scrudato, Kappel, and Seem with SMI's Senior Vice President John Battaglia and Engineering Chief Jim Daigler. SMI seemed committed to reiterate and explain each of the five concept plans, to which we agreed. Immediately afterward, we explained that we had synthesized a single version which we wished to explore. A somewhat disquieting aspect of the meeting was Battaglia's insistence that there had to be agreements for the Service to "give" something in return for SMI spending money to assuage our concerns.

We conveyed to them that instead of saying "trust me -- and we'll do something good", we would prefer that they show good faith and "do something good -- and then we will trust you". Parts of the meeting were constructive and harmonious; other parts were not. We left them with the sure knowledge that we would agree where we could -- and that we would disagree as necessary in the media and with the non-Government organizations as it became necessary. We agreed to meet again in April to try to pull a package together.

- On May 1st, Hocutt hosted John Battaglia (Senior Vice President), Gary DiMico (Executive Vice President), and Dan Brie (part-owner) of Seneca Meadows Landfill (SMI). The meeting was to discuss pending developments for expansion and the upcoming public meetings. Also, they wished to discuss the proposed "Wetlands Foundation" that SMI wishes to initiate for the Service and NYSDEC. Hocutt advised that we still favor the concept, but that active discussion and implementation should await hearings and actions upon their summer/fall 1995 applications and hearings for a large expansion. We stressed that to carry out discussions prior to permit hearings would create a public impression that a "foundation" would be a trade-off for a permit.
- On August 7, Hocutt participated in a public information meeting conducted by NYSDEC regarding remediation of the Tantalio Hazardous Waste ("Superfund") Site located south of Seneca Meadows

Landfill. Over 150 people attended, along with DEC staff from Albany and Region 8. Hocutt was able to introject a fair amount of historical knowledge into the proceedings based upon his experiences in the early 1980's when drummed industrial wastes were routinely buried.

- On September 11, Hocutt and Lamoy went to Ithaca, New York to visit with Bill Kappel, Senior Hydrologist with the U.S. Geological Survey. The subject of the meeting was the Seneca Meadows expansion and it's hydro-geological ramifications for Black Brook and the refuge. The meeting provided an excellent opportunity to use Mr. Kappel's in-depth knowledge of the SMI issue as a "reality check" for Service positions
- On September 13, Hocutt presented the concerns and requests of the Service at the NYSDEC-administered Scoping Meeting for Seneca Meadows Landfill. The two and a half hour meeting was held in the auditorium of the Seneca County Office Building in Waterloo, New York, and attracted some 200 people. Four newspapers and two radio stations were represented. Hocutt read the Service position (12 minutes) into the record since the proceeding was formally transcribed and on-the-record. Numerous questions were answered that night and in following days from media, private citizens, NYSDEC, and SMI engineers.
- On September 17, Hocutt met for four hours at the refuge with John Swanson, Senior Environmental Engineer, New York State Department of Environmental Conservation (NYSDEC) Region 8 Division of Solid and Hazardous Waste. The purpose of the meeting was to prepare the position paper for the Service regarding the proposed major 20-year expansion of the Seneca Meadows Landfill (SMI). The discussion centered around the Tantalio Superfund Site, hazardous/toxic waste landfilled between 1976 and 1981, and possible modification of the monitoring protocol and the closure/post-closure escrow account.
- In October, we learned that John Battaglia was leaving SMI to start his own engineering firm in Buffalo, New York. This was a major blow to refuge/SMI relations. Battaglia had a clear understanding of the importance of the refuge, and our absolute intent to see it protected. Further, he viewed engineering as a mix of science, social responsibility, and ecological responsibility. A rare man -- he will be missed. An example of this was that no more meetings with SMI occurred in 1995.

Finger Lakes Ecology Association

At the request of a number of local environmentalists, Hocutt agreed to serve as a Technical Advisor to a group which was formed in February, 1995 to counter pressures by residents and camp owners around Cross Lake and along 34 miles of the Seneca River to force the New York State Thruway Authority/Canal Corporation to lower Cayuga and Seneca Lakes by up to two additional feet in winter and summer. The purpose of the lower levels would be to use the basins of both lakes as "flood storage" reservoirs, allegedly to eliminate "flooding" along the river and Cross Lake during seasonal high water periods.

The refuge initiated a position paper over a year ago which was developed by NYSDEC Fishery and Wildlife Biologists, Biologists from area Universities, Cortland ES Office, and Refuge Biologists, which illustrated that such drawdowns would wreak ecological havoc with these two largest of the Finger Lakes. Hocutt has been active for over five years as a member of the Governor's Central New York - Finger Lakes Regional Flooding Advisory Committee, and also as a member of three of the regional focus groups for the New York State Recreationway, whose charge it is to convert the 535-mile New York State Barge Canal, Cayuga Lake, and Seneca Lake into a statewide recreational waterway.

Despite our trepidations about a new and very large commitment of time, we agreed to work with the group advocating stable lake levels within the 35-year old rule curves which governed both Finger Lakes. The ramifications for the refuge, the expansion project, and fish and wildlife resources in New York State are just too great to ignore. For example, a shift to lower summer lake levels would destroy the function of the refuge's gravity-based, 1.5 million dollar Cayuga Lake Connector. Some 6,000 acres of submerged aquatic beds would have been lost in the shallow north end of Cayuga Lake.

Consequently, the following actions were taken during the period:

On February 9, Hocutt met at the Varick Town Hall in Seneca County and provided historical perspective, wildlife/fishery information, and other materials to some 40 lakeshore residents and marina operators. Declined request to be Chairman of new group, but agreed to serve as Technical Advisor on ecology issues.

On February 16, Hocutt met at the Varick Town Hall with approximately 40 persons. Name of group was voted upon, and Finger Lakes Ecology Association (F.L.E.A.) was chosen. Helped devise strategies to interface with the 1,000-member

Seneca Lake Pure Water Association. The stated purpose of the group evolved to: (1) support the Canal Corporation's attempt to stay within the 35-year old rule curves; and (2) network with local and state politicians to educate them that lake owners/users must be part of all future political and agency decisions about lake levels on Cayuga and Seneca Lakes.

On February 22, Hocutt hosted the F.L.E.A. steering committee at the refuge. After four hours, the group adopted a skeletal issues and problems outline that Hocutt prepared at the request of the Chairman and Vice-Chairman at the February 16 meeting.

The refuge's "technical advisory" role with the Finger Lakes Ecology Association (F.L.E.A.) continued unabated during the period. Public criticism of the Canal Corporation of the New York State Thruway Authority for their management of water levels in Cayuga and Seneca Lakes rose to a crescendo as it became obvious that Cayuga Lake would not reach it's full summer level during 1995. This of course is due to a dry fall, negligible snow pack, and non-existent spring rains.

Consequently, much time was spent in trying to calm the tempers of F.L.E.A. members. It is probably well that F.L.E.A. was in existence during the period. District Canal Engineer John Zmarthie at least had access to a single voice (albeit an angry one) instead of a great number of individual complaints. Hocutt attended F.L.E.A. meetings on April 6th (Steering), 7th (Steering), 10th (Membership), 13th (General Membership), and 27th (Combined Committees). The refuge hosted all but the April 13th meeting. Hocutt worked with Cliff Creech, Fish and Wildlife Administrator, NYSDEC Region 8 (Cortland) to define Fish and Wildlife impacts of lower lake levels in Cayuga and Seneca Lakes.

Hocutt was contacted by a number of political staffers regarding threats to wildlife associated with lower lake levels. These included Jeff Gilka, Chief of Staff to Michael Bragman (New York State Assembly Majority Leader), and Barbara Bannister (Assemblyman Dale Fessenden). Our counsel to their questions was that they not schedule "public meetings", which would be no-win for them, but rather, that they participate in the large F.L.E.A. public meeting on June 15th, 1995.

Technical support for F.L.E.A. was extensive during May. Hocutt attended meetings on the 1st (Membership Committee), 3rd (Steering Committee), and 17th (General Membership). A date (June 15th) was set for the twice-postponed large public informational meeting to be held in Trumansburg, New York (just outside Ithaca). Membership (at \$5.00 per)

topped 800 at month's end -- a phenomenal accomplishment for a group only three months old!

Activities associated with the Finger Lakes Ecology Association (F.L.E.A.) occupied a majority of Hocutt's time during the period. A general membership meeting was held in Varick, New York on June 1 where Hocutt made an extensive presentation. An advertised public meeting was held at 7:00 p.m. on June 15, 1995, at the Trumansburg, New York Elementary School. One hundred twenty six persons (four media) attended. Dr. Guy Baldassarre (State University of New York College of Environmental Science and Forestry at Syracuse) moderated the meeting at our request. Presentations were made by District New York State Thruway Engineer John Meldrin and District Canal Engineer John Zmarthie. A panel discussion followed with panelists Cliff Creech (NYSDEC R-7 Fish and Wildlife Administrator), Hocutt, Meldrin, and Zmarthie. The meeting was very effectively set-up and administered by Donna Scott, Food Technology Department, Cornell University. It was clear that most of the 126 participants were starting to realize what could be lost by significantly lowering lake levels.

We could not rest on our success. On June 16, we learned that the New York State Senate passed a bill the evening before which made "flood prevention and control" the first priority of the Canal Corporation -- and allowed floodplain residents to sue for damages if they failed. No infrastructure exists in the Canal system to deal with floods. Hocutt met with the steering committee of F.L.E.A. on June 19 and participated in an emergency general membership meeting on June 23.

As a result of a number of contacts statewide, Hocutt received a number of phone calls from a broad diversity of elected officials. Calls were taken from two New York State Assemblymen, staff to other state assemblymen, and two State Senators. Off-the-record interviews were given to four trusted newspaper reporters. A lengthy discussion was held with the Pataki administration's Senior Program Analyst.

By week's end, F.L.E.A. had sent out news releases and taken out newspaper advertisements urging Governor Pataki to veto any legislation based upon the Senate bill and the two state bills. On Friday night, June 31, Hocutt was called by the Chairman of the Governor's Conservation Fund Council and advised that there would be no law in this session.

On August 23, Hocutt hosted at the Visitor Center a diverse group of leaders of sportsmen's organizations from a 10 county area of central and western New York State. The evening meeting was called by Bob Banister, Chairman of the New York State Conservation Fund Advisory Board. The

meeting was attended by approximately 25 persons. Banister "jacked" the officers up pretty well for their inactivity so far in the lake level issue and the Finger Lakes Ecology Association (F.L.E.A.). As a result of the meeting, groups representing almost 4,000 members will weigh in on the side of F.L.E.A.'s concerns about impacts upon fish and wildlife from lower lake levels.

On October 17, Hocutt and Lamoy hosted the Seneca County Federation of Conservation Clubs at the refuge Visitor Center. Bob Banister, Chairman of the Governor's Conservation Advisory Fund, gave an in-depth presentation about the proposed lowering of water levels in Cayuga and Seneca Lakes. He chastised the sportsmen for not exerting more political pressure upon Governor Pataki to kill efforts to pass legislation which would have resulted in lower lake levels. Hocutt gave a presentation about the biological impacts of lake drawdowns, and answered numerous questions.

Canals 2000

Lamoy attended Focus Group Meeting #3 of the Finger Lakes Canal Planning Group on January 10. The Canal Recreationway Plan is rapidly taking shape. Unfortunately, past "suggestions" and "concepts" are taking on the form and shape of "projects" and "destinations". Many of the specifics they are proposing through and near the refuge are either not legal (e.g. horseback riding, snowmobiling) or not compatible (e.g. bicycling, cross-country skiing). This, despite the many meetings with various personalities at all the hierarchical levels of the Canal Commission throughout 1994. A succinct memo was sent out with cc's to several levels late in January reiterating the environmental sensitivity of the refuge and the necessity of compliance with laws and policies governing the NWRS.

On the morning of June 27, Hocutt met with and provided a tour of the refuge for David and Ellen Nutter of Nutter Associates of Rochester, New York. Their planning firm has 40% of the New York State Barge Canal Corporation's Canals 2,000 Recreationway proposal. Following the tour, a lengthy discussion was held regarding the entire lake level controversy and it's possible impacts upon the Recreationway Plan.

On September 19, Hocutt participated in the monthly meeting of the Cayuga County Environmental Management Council in Auburn, New York. He actively intervened in the decision to form a sub-committee which was designed to generate legislative support in the Cayuga County Legislature to give credibility to criticism by the Cross Lake/Seneca River Association of the USCOE/NYS study of downstream flooding.

Several discussions were held with other EMC members to seek strict limits upon the proposed subcommittee, or even it's outright abolishment.

North American Waterfowl Management Plan Activities

Montezuma National Wildlife Refuge lies within the Lower Great Lakes/St. Lawrence Basin Joint Venture and is playing an active role in achieving the objectives of the Joint Venture and the North American Waterfowl Management Plan through proactive wildlife management on the refuge. Waterfowl management centers on manipulation of water levels in the impoundments to favor growth of plant communities and habitat conditions favorable for waterfowl. Providing migratory staging and feeding habitat for American black ducks, mallards, and Canada geese is of particular management concern at Montezuma.

One of ten Focus Areas in New York is the Montezuma Focus Area in the central Finger Lakes region. This Focus Area includes a roughly circular area of land 255 square miles in size in Seneca, Wayne, and Cayuga Counties. The Montezuma Focus Area has special significance as a staging and feeding area for migratory waterfowl and resident wetland wildlife and includes the Montezuma National Wildlife Refuge; the Howlands Island, Crusoe Lake, and Cayuga Lake State Wildlife Management Areas; and the lands surrounding these areas. A final plan for the Montezuma Focus Area was completed during 1995. The plan includes a description of the resource values of the Focus Area and recommended strategies to protect, restore, and create wildlife habitats contained within its boundaries. Montezuma Refuge staff actively participated in the writing of the plan and will continue to be active during future implementation of the plan.

The Northern Montezuma Wetlands Project lies within the larger Montezuma Focus Area. This ongoing project is a major undertaking of both the New York State Department of Environmental Conservation and the U.S. Fish and Wildlife Service to expand existing state and federal lands into a total complex of approximately 35,000 acres. The Northern Montezuma Wetlands Complex is currently Region 5's largest active Joint Venture project, and was designated as the Region's "flagship" project. The project aims to: protect and enhance wetland habitats for their benefits to waterfowl, endangered and threatened species, and other wildlife; restore drained wetlands whenever feasible; improve access for compatible wildlife-related recreation, education, and research; and foster continued private involvement in the protection and enhancement of the area's wildlife resources.

F. HABITAT MANAGEMENT

1. General

The lowlands adjacent to Montezuma National Wildlife Refuge were once a contiguous 16,188 hectare (40,000-acre) wetland complex. Following construction of the New York State Barge Canal in 1906, aspiring investors were able to drain the wetlands for agricultural production since the canal bisected the wetland complex, effectively lowering the water table. Much of the former wetland acreage was drained to allow agricultural practices to exploit the rich muck soils.

Montezuma National Wildlife Refuge was established on September 12, 1938 to protect what remained of the original wetland complex. The enabling legislation (Executive Order 7971) established the area as a refuge and breeding ground for migratory birds and other wildlife in order to effectuate further the purposes of the Migratory Bird Conservation Act of 1929.

The refuge's primary objective is to provide habitat and protection for waterfowl, other migratory birds, and endangered species; and to insure the availability of these resources to the American people for their enjoyment now and in the future. To meet these stated objectives, wetland management programs are directed at improving or maintaining suitable habitats for migratory waterfowl, endangered and threatened species, and a variety of other migratory and resident wildlife species endemic to central New York.

Habitat management activities at Montezuma emphasize numerous goals which include: enhancement of existing wetlands and grasslands; restoration of wetlands both on and off-refuge; active management of grassland/brushland areas; and the maintenance of climax and late second-growth wooded wetlands.

2. Wetlands

Over 75% of the refuge's 2,785 hectares (6,882 acres) is classified as wetland. Management of wetland habitats is the cornerstone of effective habitat management at Montezuma. Water level manipulation is the primary technique used to manage the system of large impoundments found on the refuge. Three major wetland classes are found at Montezuma including Aquatic Bed, Emergent Wetland, and Forested Wetland.

Aquatic Bed presently totals 728 hectares (1,800 acres), and refers to wetlands and deep water habitats dominated by plants that grow principally on or below the water surface.

Representative species include sago pondweed, white water lily, coontail, bladderwort, duckweed, and several additional species of pondweed.

Emergent wetland, characterized by erect rooted herbaceous hydrophytes, presently totals 546 hectares (1,350 acres) and typically occurs in calmer, more shallow water. Dominant emergent vegetation includes cattail, and two exotic plants, purple loosestrife and common reed. Bulrush was once a significant component of the emergent plant community but now occurs only as isolated clumps and in small sparse stands.

Forested wetland is the largest wetland habitat type at Montezuma, comprising 749 hectares (1,850 acres). The term generally refers to wetlands dominated by woody vegetation greater than six meters in height, and can range from temporarily or seasonally flooded regimes to permanently flooded dead trees. Dominant trees includes ash, swamp white oak, red maple, and eastern cottonwood. The understory is sparse, and includes common winterberry, northern spicebush, and highbush blueberry.

In general, water levels in our wetlands were difficult to manage due to near record drought conditions across central New York through the first nine months of 1995. Water elevations in our impoundments were slightly below to moderately below proposed levels for most of the year.

Currently, dikes impound some 1,416 hectares (3,500 acres) of freshwater marsh contained within the Main, Tschache, May's Point, North Spring, and South Spring Pools. The following sections provide a brief historical perspective for each of the refuge's five major impoundments and a summary of significant occurrences during 1995.

Main Pool

Using CCC labor, approximately 5.3 kilometers (3.3 miles) of dikes were constructed with little or no imported fill to impound the 486 hectare (1,200-acre) Main Pool. The pool was flooded in 1942, and has been managed as an impoundment since that time. Several water level management strategies have been implemented on the pool throughout it's history.

Shortly after the Main Pool was created, much of the open water area supported broken stands of cattail and bulrush. The interspersed of open water and emergent vegetation provided excellent waterfowl pair bonding and brood habitat. In the early 1950's purple loosestrife became established within the impoundment and eventually displaced much of the native emergent vegetation. Refuge management practices to

control purple loosestrife have included stress flooding and mechanical cutting of the plant below the water surface. Both of these control methods, although successful, restrict water level management options.

An additional management problem on the Main Pool (and other refuge impoundments) is the presence of large numbers of carp. The fish are responsible for degradation of water quality and reductions in the abundance of submerged aquatic vegetation. Winter drawdowns in conjunction with rotating drums and other obstructive devices on water control structures have worked effectively to remove and exclude carp, but spring floods from the adjacent Barge Canal frequently overtop dikes and structures and bring carp back into the impoundment.

The Main Pool is a large emergent marsh/open water impoundment providing a unique habitat type for the region. Large beds of submerged aquatic vegetation within the pool provide a carbohydrate-rich food resource. Extensive stands of sago pondweed serve to attract large numbers of staging and migrating waterfowl. Refuge management efforts are directed at maintaining and enhancing this impoundment for carbohydrate production and preserving its role for staging waterfowl.

A partial drawdown of Main Pool was instituted over the summer months to consolidate sediments on the perimeter of the impoundment and encourage germination of moist soil vegetation. Beggarticks, smartweeds, and ricecut grass became established on small scattered areas of exposed sediments fringing the pool perimeter. Although purple loosestrife also germinated, the partial drawdown demonstrated that seed banks of desirable species are present and future more extensive drawdowns may promote further growth of desirable moist soil vegetation.

Due to evapo-transpirative water loss, the level in Main Pool dropped considerably during late June and early July. To replace this water loss and to provide water for Benning Marsh, the Cayuga Lake water connector was opened for approximately three weeks.

A small force-account construction project was completed on the Display Pool during the summer of 1995. Work included excavating 30 years worth of accumulated silt, reforming the side slopes, and removing two of the three nesting islands. The pool, when regrowth occurs and when refilled, will provide an attractive shallow water demonstration area. The Display Pool will be the first site visible to visitors entering the refuge.

Benning Marsh

This small impoundment, located immediately adjacent to the Wildlife Drive, was created primarily to provide shorebird habitat during spring and fall migration.

To prepare this unit for the fall shorebird migration, the dense sod cover of the impoundment bottom was broken up and turned under using a tractor-drawn disc. This process was repeated several times during July and early August and the Unit was then shallowly flooded in mid-August to create mudflat and shallow water habitat for shorebirds.

Both shorebird and waterfowl use increased immediately following shallow flooding. Many species of shorebirds could be observed on the Unit which is situated immediately adjacent to the Wildlife Drive. Some of the more interesting species observed included black-bellied plovers, lesser golden plovers, short-billed dowitchers, and greater yellowlegs.

Tschache Pool

Traditionally known as the Storage Pool, Tschache Pool is a 445 hectare (1,100-acre) impoundment created by CCC labor following completion of a 5.2 kilometer (3.25-mile) long dike. The pool was first flooded in 1944, and has been managed as an impoundment since. The pool contained swamp timber and open wetlands when first created. The timber eventually died and the majority of the trees have since fallen.

The dead timber marsh is home to two active bald eagle nesting territories. The dike encompassing the pool was again closed to the public so as not to unduly disturb the nesting bald eagles. Our own presence along the dike was kept to a minimum during critical periods during the nesting season.

Tschache Pool had been held at constant high water levels for many years. The high water regime precluded the establishment of moist soil vegetation and contributed to the development of a deep layer of unconsolidated bottom sediments. Over time the pool evolved into an emergent cattail-purple loosestrife/open water marsh. Eutrophic changes in the impoundment over the 50 years since its completion had significantly degraded the wildlife value and habitat diversity of the marsh.

To reverse the ongoing eutrophication process within the impoundment and take the first steps toward restoring the resource values of the area, a growing season drawdown of

Tschache Pool was implemented during 1995. Objectives of the drawdown were:

- 1.) Oxidize and consolidate the deep layer of organic bottom sediments within the impoundment.
- 2.) Provide conditions favorable for the germination and growth of moist soil vegetation.

The stop-logs were removed on Tschache Pool during the second week of May to completely drain the impoundment. The drawdown was maintained throughout the growing season, greatly aided by the summer-long drought which gripped most of upstate New York. The dry weather aided tremendously in consolidating and oxidizing the exposed bottom sediments. Vegetation response to the drawdown was tremendous. The entire pool bottom literally turned a lush green as smartweeds, sedges, and cattail seedling germinated.

Tschache Pool remained essentially dry until late October when over seven inches of rainfall refilled the impoundment. As the rain fell, water within the pool slowly spread out from the borrow ditches and flooded the dense stands of vegetation growing on the impoundment bottom. Waterfowl response was immediate, spectacular, and gratifying. Flocks of ducks, literally like swarms of mosquitos, could be observed circling and dropping into small openings within the dense stands of umbrella sedge, smartweed, bidens, and cattail.

Tens of thousands of ducks were drawn to the rich food resources of the newly-reflooded impoundment. Dominant species included mallard, American black duck, green-winged teal, wood duck, and American wigeon. It was truly a gratifying experience to see swarms of waterfowl respond to and benefit from refuge habitat management practices on Tschache Pool.



Tschache Pool immediately following dewatering in late May. (95-11; TAG)



As the summer progressed, Tschache Pool turned a lush green as smartweeds, sedges, and cattail seedlings covered the pool bottom. (95-12; MKS)



Umbrella sedge quickly became established on the rich substrate exposed by the drawdown. (95-13; MKS)



October rains reflooded Tschache Pool and made available a bountiful food resource for migrating waterfowl. (95-14; TAG)



Additional view of Tschache Pool growth after reflooding. (95-15; TAG)



Ducks and geese were quick to respond to the food resources available on the impoundment. (95-16; TAG)

May's Point Pool

In 1954 construction of the New York State Thruway across the north end of the Main Pool isolated approximately 65 hectares (160 acres) which came to be known as May's Point Pool. The pool is an open water marsh impoundment. Several water level management strategies have been implemented on this pool during its history. Current management of May's Point Pool is directed toward maintaining low water levels and exposed mudflats during the spring and fall to provide habitat for migrating shorebirds. We have had excellent success in attracting large numbers of shorebirds, and the viewing opportunities have been very popular with upstate New York birding enthusiasts.

Shorebird and waterfowl response to this year's late summer/fall drawdown of May's Point Pool was immediate and spectacular. Hundreds of blue and green-winged teal, mallards, American wigeon, and gadwalls were observed on the Unit immediately after the mid-August dewatering. Shorebird species response was equally impressive. Hundreds of sandpipers and plovers were observed on the pool immediately after the drawdown began and large numbers of foraging shorebirds were observed on the mudflats throughout the fall. Sightings included: Hudsonian godwits, black-bellied and lesser golden plovers, Baird's sandpiper, and stilt sandpiper.

Work was completed on the Box Elder Bog wetland project during 1995. The area, a 4 hectare (10-acre) waste field between May's Point Pool Dike and the Clyde River, had an old low-height perimeter dike and was dominated by box elder sprouts, purple loosestrife, and reed canary grass. Using Iroquois' 750B dozer, the perimeter dike was reconstructed and broadened. Both intake and outflow structures and pipe were installed to allow for periodic flooding and draining of the unit. Following completion of construction work the perimeter dike was disced, fertilized, seeded, and mulched. The impoundment bottom was also disced to remove unwanted purple loosestrife and box elder growth. Our intent, beginning in 1996, is to manage the new unit to provide seasonal shorebird habitat (shallowly flooded and exposed mudflats) similar to the Benning Marsh Unit.

North Spring Pool

In 1957 a .5 kilometer (.31-mile) long dike was constructed along the west side of State Route 89 to create the 20.2 hectare (50-acre) North Spring Pool. The impoundment flooded swamp timber which has died due to permanent inundation. The high sulfur and tannic acid levels of the pool have greatly restricted the growth and expansion of

emergent vegetation. Purple loosestrife is confined to stumps, fallen decaying logs, hummocks, and along the dike. Several of the stumps and hummocks were used as nesting sites by Canada geese and mallards. An abundance of duckweed during the autumn months provided a good source of food for migrating waterfowl. Throughout much of the fall this pool teemed with American black ducks, mallards, gadwalls, and Canada geese.

South Spring Pool

The South Spring Pool was formed by the construction of a .8 kilometer (.5-mile) long dike in 1958. This 14.2 hectare (35-acre) pool is located directly south of the North Spring Pool and is supplied by several springs originating on the western boundary of the refuge. Water from this pool can be diverted into Main Pool or to North Spring Pool. As is true with North Spring Pool, purple loosestrife is confined to disturbed or exposed areas, such as dikes and rotting tree stumps. Loosestrife is less prevalent in South Spring Pool than in North Spring Pool. Historically, both North and South Spring Pools were forested, but changes in hydrology resulting from dike construction and water impoundment caused mortality of the standing timber. Although complete dewatering is possible, both pools currently are maintained in a permanently flooded condition to prevent purple loosestrife germination. The basins are unconsolidated and the mineral content (iron and sulphur) is high. These factors appear to effect invertebrate production and growth of vegetation.

These two units have the potential of providing additional wildlife benefits (invertebrate production, cover, moist soil vegetation, habitat diversity) if drawdowns were to occur. In the future, we plan to return one of these units to a forested wetland community. To accomplish this, the unit would be completely dewatered for three to five growing seasons. This would allow tree seedlings to establish themselves prior to instituting an abbreviated flooding regime. The unit would then be flooded during the non-growing season to provide an invertebrate resource, nesting habitat, and staging/resting habitat for migratory waterfowl.

3. Forests

Approximately 749 hectares (1,850 acres) of the refuge are non-commercial woodland, the majority of which is classified as forested wetland. The term generally refers to wetlands dominated by woody vegetation greater than six meters in height, and can range from temporarily or seasonally flooded

regimes to permanently flooded dead trees. Red maple, ash, eastern cottonwood, and swamp white oak share dominance in the forest canopy on the majority of the sites establishing a muck-hardwood association common in the region. American elm, a former major component of refuge forests, was essentially lost to disease. Blue beech occurs infrequently as part of the understory. Species typical of alluvial soils, such as American sycamore and silver maple, are noticeably absent on the poorly drained muck soils that underlie the majority of the refuge's forested wetlands.

The understory of these forested wetlands is typically sparse, and includes common winterberry, northern spicebush, and highbush blueberry. These understory shrubs are largely confined to hummocks. Species common to the transitional zones between hummocks and vernal pools include fern, skunk cabbage, and false nettles.

Upland forested sites on the refuge include Clark's Ridge and Esker Brook. These areas are dominated by second growth stands of hickory, black walnut, and white ash.

The refuge's forested acreage is large and diverse enough to support forest interior breeding birds and most forest bird species which occur in central New York. Numerous dead snags are dispersed throughout these forested tracts and provide ample cavities for tree swallows, woodpeckers, wood ducks, and a variety of other wildlife. The forest stands are heavily used during spring and fall migration by not only mallards, American black ducks, and wood ducks, but by many species of neotropical migrant songbirds.

Unit 17

Unit 17 was originally constructed as a green-timber reservoir in 1965. Management of the unit was initially designed to provide wood duck breeding habitat and as such was flooded from March through mid-July. Continued long-term flooding during the growing season, however, was severely stressful to the mature trees and was discontinued in 1977. Since that time the water transport facilities (channels, control structures, and diesel-operated pump) have fallen into disrepair through lack of use.

This area consists of a large tract of bottomland hardwoods that separates the northern terminus of Cayuga Lake from the extensive open marsh systems which comprise the major waterfowl habitats of the refuge. The forest lies completely within the immediate extension of the Cayuga Lake Basin, and is bordered by cultivated upland to the west (drumlins), the Seneca-Cayuga Canal to the south, and the Seneca Canal to the east. The tract was utilized to

construct two 121-hectare (300-acre) experimental impoundments in 1965. The impoundments are separated by a mid-dike, and have been simply termed the East and West Pools.

In support of recent research demonstrating the critical importance of high-protein food sources to pre-nesting female dabbling ducks, the refuge has proposed that Unit 17 be flooded in mid-March. The early spring flooding would provide several hundred acres of foraging habitat for pre-nesting female dabbling ducks (mallards, wood ducks, American black ducks, northern pintails, and gadwalls) which will subsequently nest at Montezuma or elsewhere within the Atlantic Flyway. The flooded bottomlands would insure the availability of high-protein invertebrate food sources at a critical period during migration. The birds will then enter the metabolically stressful nesting period in better condition. Water will be drained from the unit by the first of May to allow an adequate growing period for the mature hardwoods, insuring continued maintenance of the valuable bottomland hardwoods habitat used by a diversity of migrating birds and resident wildlife.

The wooded wetlands of Unit 17 were the focus of a graduate research project initiated in 1995 by Ms. Amy Deller of the State University of New York College of Environmental Science and Forestry at Syracuse, New York. Ms. Deller, working under the guidance of Dr. Guy Baldassarre, is revisiting and updating the wealth of information developed over the past 30 years in Unit 17. Ms. Deller's master's project is more fully described in Section D.5.

5. Grasslands

The management of fields of undisturbed grassland cover at Montezuma is designed to provide approximately 200 hectares (500 acres) of various age fields for habitat diversity, nesting cover for waterfowl and ground nesting birds, and improved wildlife viewing opportunities for the visiting public. To achieve this objective, grassland areas on the refuge have been divided into several Grassland Management Units (GMUs). The Grassland Management Program at Montezuma insures a variety of grassland and old field habitats. The interspersions of habitat types substantially increases the availability of ecotones and promotes wildlife diversity.

During 1995, mowing occurred in GMU I adjacent to the refuge's Visitor Center; GMU III near South Spring Pool; and GMU IV B and C - the central and north fields at Esker Brook. All fields were mowed to remove encroaching brush and woody vegetation. Cutting heights were maintained at

approximately 20 centimeters (eight inches) using rotary and sickle bar mowing attachments. Mowing was delayed until late July and August to prevent nest destruction of late-nesting and renesting waterfowl and ground-nesting bird species.

Present vegetative conditions in refuge grassland fields are representative of early old-field successional stages. Encroachment of woody plants and noxious weeds into the refuge's grassland communities is occurring at an increasing rate. Current mowing practices have had only marginal success at limiting woody plant encroachment. Refuge staff are currently reviewing the potential of using prescribed burning as an alternative to mowing in order to maintain a desirable grass/forb species mix within managed grassland fields.

Dr. Chris Norment, SUNY-Brockport, initiated a Research/Management Study on the refuge to investigate the effects of grassland habitat management on nongame bird community structure and function. Details of Dr. Norment's research are provided in Section D.5.

6. Other Habitats

Within the boundaries of the refuge are 40.4 hectares (100 acres) classified as river and stream riparian corridors, brush, and small isolated grassland areas. These areas are not normally subjected to intensive habitat manipulation, and are allowed to proceed through a natural pattern of successional change over time. These small areas, as they undergo natural successional change, provide an important component to overall habitat diversity on the refuge.

Several acres of land immediately adjacent to administrative, maintenance, and public use areas are managed in accordance with their respective uses.

9. Fire Management

A cooperative agreement for both wildfire and prescribed fires remained in effect with the Magee Volunteer Fire Department, Inc. during 1995. A Blanket Purchase Order with the Department provides for reimbursement of costs associated with mobilization for structural fires and/or alarm system responses. A total of \$500.00 was obligated for alarm system responses during 1995.

No wildfires occurred on the refuge during 1995.

No prescribed fires were initiated on the refuge during 1995. Historically, fire was used as an effective management tool at Montezuma to suppress the invasion of undesirable woody species in upland habitats, maintain existing grassland types as nesting cover, and remove excess dead vegetation (primarily cattail) in the dry marsh. In 1968, following a reevaluation of the Refuge Burning Plan, the use of prescribed fire as a management technique was discontinued. The contribution of fires to local air pollution and the potential dangers smoke would create for vehicles on the New York State Thruway were cited as reasons for reaching the decision to discontinue prescribed burning.

Refuge staff have recently begun to question this decision to discontinue prescribed burning as a habitat management technique at Montezuma. We would like to use prescribed fire to address problems with extensive monotypic stands of cattail, encroachment of *Phragmites* in refuge impoundments, and the deterioration of upland fields due to invasion of woody species and undesirable perennials.

Refuge staff believe that safe prescribed burning is feasible at Montezuma if conducted under the right weather conditions (particularly wind direction, soil moisture, and fuel types). Several other conditions will also need to be met to conduct a successful burn program at Montezuma. These include:

- Securing the necessary state burn permits and air quality clearance.
- Communication with the public, media, and public safety officials.
- Ensuring smoke monitoring on highways and obtaining traffic control if necessary.
- Obtaining sufficient water handling equipment and heavy equipment (tracked ATV) to construct firebreaks and transport crews.
- Securing the assistance of sufficient trained personnel through neighboring refuges or other cooperators.
- Rewrite the Fire Management Plan to allow for prescribed burning. The prescribed fire portion of the Plan will require an Environmental Assessment with public involvement.

Refuge Biologist Gingrich travelled to the Regional Office on July 25-27 to attend the Regional Fire Management Plan Preparation Training as an initial step toward reinstituting

the use of prescribed fire as a habitat management technique at Montezuma.

On March 28, Deputy Manager Lamoy and Biologist Gingrich provided assistance to New York State Department of Environmental Conservation Region 7 personnel with a prescribed burn on approximately 12 acres of state-owned land near the town of Savannah. No problems were encountered during the burn, and the state personnel accomplished their objective of killing encroaching woody vegetation within the grassland/cattail unit.

10. Pest Control

Purple loosestrife and *Phragmites* are common pest plants on the refuge. Both species exist on the periphery of many of our impoundments. Early in September, Maintenance Mechanic Flanders completed Roundup application to *Phragmites* and purple loosestrife around the eastern side of the Main Pool using a tractor-mounted boom spray rig. Treated areas were partially mowed approximately two weeks following spraying. Remaining stands were mowed as patches (if they were dense stands) to allow for sunlight penetration and to stimulate growth of more desirable vegetation during the 1996 growing season.

We are optimistic that the biological control program for purple loosestrife being implemented on the refuge by Dr. Bernd Blossey of Cornell University will reduce our need to spray purple loosestrife in the near future. Dr. Blossey's research is described in detail in Section D.5.

12. Wilderness and Special Areas

There are two designated Research Natural Areas (RNA) on the refuge. Maple Knoll, a 3.2-hectare (8-acre) tract located southwest of Tschache Pool, is a prime example of a mature, northern hardwood beech-maple forest cover type. The beech-maple association provides a unique habitat type not found elsewhere on Montezuma Refuge.

The second RNA, Swamp Woods, is a tract of approximately 40.5 hectares (100 acres) located southwest of the Main Pool. It is an unusual stand in that it is the last remaining undisturbed example of swamp woodland on the refuge. It was once the common woodland type found on muck soils throughout the historic Montezuma wetlands, but has now become rare due to land clearing and draining of muckland for farming.

The dominant tree species are red maple, swamp white oak, and ash. Sensitive fern dominates the understory along with royal fern which grows on hummocks. Arrowhead, water plantain, and skunk cabbage grow in the sandy soil between the hummocks. Black alder and spicebush are common shrubs. Numerous dead snags are dispersed throughout the natural area and provide ample cavities for tree swallows, woodpeckers, wood ducks, and a variety of other wildlife. The unit is heavily used during spring and fall migration by not only mallards, American black ducks, and wood ducks, but by many species of neotropical migrant songbirds.

An 850-hectare (2,100-acre) portion of the refuge has been designated as a National Natural Landmark under provision of the Historic Sites Act of 1935. A large section of the Main Pool, including Maple Island and Black Lake, is representative of conditions in the original marsh in which broad expanses of cattail marsh were interspersed with old river channels and ponds. This area, along with other portions of the refuge, serves as a resting and feeding area for migrating waterfowl and provides nesting for many species of ducks, herons, and other waterbirds.

Cattail forms the main vegetation in the marsh, often occurring in pure stands, but sometimes mixed with purple loosestrife, bulrushes, sedges, and swamp loosestrife. Other plant species common in the marsh are common reed, smartweed, and burreed. The cattails and other plants appear as islands of emergent vegetation in a shallow lake. The Swamp Woods RNA borders the southern edge of the Montezuma Marshes National Natural Landmark.

G. WILDLIFE

1. Wildlife Diversity

Montezuma National Wildlife Refuge provides habitats for, and subsequently attracts, an abundance of wildlife species. Sixteen species of amphibians, fifteen species of reptiles, forty-three species of mammals, and two hundred forty-two species of birds have either been recorded or can reasonably be expected to be present on the refuge for a portion of the year.

The wide array of both resident and migratory species found on the refuge is due to the varied habitat types found in the marsh/upland complex. The mix of wooded wetlands, emergent marsh, and mixed successional stages of vegetation on the upland areas all contribute to the species diversity of the wildlife community found at Montezuma.

The value of the wetland and associated upland habitat within the Montezuma Refuge has been recognized at both the state and national levels. The refuge has assumed a significant role in the Atlantic Flyway as a major staging, feeding, and resting area for tens of thousands of migratory waterfowl. A significant proportion of the mid-Atlantic population of Canada geese utilize the refuge during both spring and fall migration. In addition, a growing number of these birds are now overwintering in the Cayuga Lake Basin. Numerous species of shorebirds, wading birds, and neotropical migrants depend heavily on this area as well. Resident mammal species most noticeable in the area include white-tailed deer, beaver, muskrat, raccoon, mink, and fox.

Of interest each year is the appearance of many rare or uncommon bird species on the refuge. 1995's unusual sightings included:

- Horned grebe on the Main Pool on March 28 and 29.
- Two red-necked grebes sighted on Tschache Pool on April 29.
- Yellow-headed blackbird observed along the Wildlife Drive from April 28 to the 30.
- Eurasian wigeon on the Main Pool during the month of May.
- Glossy ibis sighted on the Main Pool on May 13.
- Whimbrel observed on the Main Pool on June 2.
- Glossy ibis on May's Point Pool from October 11 to 13.
- Northern mockingbird sighted on the Clark's Ridge area of Tschache Pool on November 24.
- Sandhill crane on May's Point Pool during the first week of November.

2. Endangered And/Or Threatened Species

The following is a list of endangered, threatened, and/or state-listed species of special concern which may be found on the refuge or are reported to be present in the immediate area:

<u>Species</u>	<u>Status</u>	
	<u>Federal</u>	<u>State</u>
Peregrine Falcon (<u>Falco peregrinus</u>)	E	E
Bald Eagle (<u>Haliaeetus leucocephalus</u>)	T	E
Osprey (<u>Pandion haliaetus</u>)		T
Northern Harrier (<u>Circus cyaneus</u>)		T
Common Tern (<u>Sterna hirundo</u>)		T
Spotted Salamander (<u>Ambystoma maculatum</u>)		SC
Jefferson Salamander (<u>Ambystoma jeffersonium</u>)		SC
Wood Turtle (<u>Clemmys insculpta</u>)		SC
Small-footed Myotis (<u>Myotis leibii</u>)		SC
Upland Sandpiper (<u>Bartramia longicauda</u>)		SC
Black Tern (<u>Chlidonias niger</u>)		SC
Common Barn Owl (<u>Tyto alba</u>)		SC
Short-eared Owl (<u>Asio flammeus</u>)		SC
Common Nighthawk (<u>Chordeiles minor</u>)		SC
Eastern Bluebird (<u>Sialia sialis</u>)		SC
Vesper Sparrow (<u>Poocetes gramineus</u>)		SC
Henslow's Sparrow (<u>Ammodramus henslowii</u>)		SC
Grasshopper Sparrow (<u>Ammodramus savannarum</u>)		SC

E - Endangered T - Threatened SC - New York State
Species of Special
Concern

A). Bald Eagle

The bald eagle is the most frequently observed endangered/threatened species at Montezuma. From 1976 to 1980, the refuge was the release site for a hacking program designed to reintroduce the bald eagle to New York. This cooperative program between the New York State Department of Environmental Conservation and the U.S. Fish and Wildlife Service resulted in the release of a total of 23 young bald eagles to the wild.

An active bald eagle nesting territory has been located on the refuge since 1987. When first discovered, the nest was one of only two successful nests in New York State, and represented the first nesting success on the refuge since 1956. To date, the bald eagles nesting on the refuge have successfully fledged a total of sixteen young.

Eagle activity is closely monitored; and the area used by the birds, Tschache Pool, is closed to the general public. The refuge's role in eagle restoration is to continuously provide protected, high-quality nesting and feeding habitat for one or more pairs of bald eagles. During 1995, student volunteers Kevin Holcomb and Alison Donofrio devoted well over one hundred hours of time monitoring bald eagle nesting activity.

1995 proved to be another successful year for bald eagle breeding at Montezuma. Both groups of birds nesting on the refuge successfully fledged young. The refuge's "traditional group" of three bald eagles fledged two young birds from their new nest site located immediately adjacent to Tschache Pool on a wooded island surrounded by the Clyde River portion of the New York State Barge Canal. A second pair of bald eagles ('the new group') also successfully fledged two young from their nest located in a dead snag in the southern end of Tschache Pool.

On June 1, volunteers from the refuge assisted a crew of NYSDEC Endangered Species personnel in banding the eaglets in the new north nest. All went well with the banding effort despite the unbelievable tangle of poison ivy vines growing up the trunk of the nest tree. No effort was made this year to band the eaglets in the south nest. The odd growth form of the dead tree supporting the nest coupled with the drawdown of Tschache Pool made banding too dangerous to attempt.

Sightings of up to a dozen individual bald eagles were recorded periodically throughout the year on Tschache, North Spring, May's Point, and Main Pools.

B). Osprey

Two pairs of osprey, a New York State designated threatened species, nested on the refuge during 1995. One pair used a nesting platform located on the Main Pool, and the second pair nested atop a communications cable transmission tower located in the extreme southeast corner of Unit 17.

The osprey nesting in Unit 17 successfully fledged two young in mid-July. Unfortunately, the pair of birds nesting on the Main Pool platform were not successful in fledging their

young. High winds, associated with a strong cold front, swept through the refuge in early July and knocked both osprey nestlings from the nest.

A third osprey pair nesting north of the refuge proper but within the boundary of the Northern Montezuma Acquisition Project successfully fledged young during 1995.

C). Peregrine Falcon

Three peregrine falcons were sighted over May's Point Pool and Main Pools by refuge visitors during the month of September. The birds were observed harassing shorebirds on the exposed mudflats of the two impoundments.

Peregrine falcon occurrence at Montezuma is normally quite transitory in nature. Birds sighted in the past several years (as was the case in 1995) have never been observed for more than a few days at a time. The birds are opportunistic foragers that capitalize on the presence of shorebirds on the refuge's exposed mudflat habitat during their migratory passage through central New York.

D). Northern Harrier

This New York State threatened species is commonly observed each month of the year at the refuge. Although no nests were directly observed, breeding by this species was confirmed using criteria from the New York State Breeding Bird Atlas Project. It is very likely that at least three pairs of harriers nested on or in the immediate refuge vicinity during 1995. Northern harriers are most frequently observed foraging over the Main Pool marsh and the adjacent grassland fields.

3. Waterfowl

A). General

Since 1938, Montezuma and its associated marshes and other wetland habitats have provided important resting and migration habitat for a diverse waterfowl population. The refuge has assumed a significant role in the Atlantic Flyway as a resting and feeding area for migratory waterfowl.

A significant proportion of the mid-Atlantic population of Canada geese now utilizes Montezuma and the central Finger Lakes area during spring and fall migrations. Fall peaks of Canada geese approximate 50,000 birds; in spring this number

has exceeded 100,000. Approximately 15,000 snow geese use the refuge during spring migration. Tundra swans have often exceeded 250 in number during both spring and fall migrations. Late fall use by mallards has approached 100,000 birds. Use by American black ducks in the fall often exceeds 25,000. Wood ducks, gadwall, green-winged teal, American widgeon, northern pintail, northern shoveler, and blue-winged teal comprise the bulk of other dabbling duck species using the refuge during migration.

Diving duck species that stop at Montezuma during migration include canvasback, redhead, ring-necked duck, and lesser scaup. Smaller numbers of bufflehead, ruddy duck, and hooded merganser also utilize wetland habitats at the refuge during migration.

Overwintering of Canada geese in the Cayuga Lake Basin continued the trend of the last two decades. The numbers of geese staying in upstate New York has skyrocketed since the early 1970's. From overwintering populations of several hundred to a few thousand, current numbers can annually approach 100,000 or more. 1995 was no different in this regard.

The New York State Department of Environmental Conservation conducted the 47th annual New York State Midwinter Aerial Waterfowl Survey beginning January 4, 1995. Unfavorable flying conditions delayed completion of the survey until January 29. A statewide total of 220,620 waterfowl was counted this year, which is 8.3% below the 1994 total and 3.3% below the previous ten-year average (1985-94).

The numbers of many species of waterfowl that overwinter in New York State were below the ten-year average. Exceptions included mallard (49.0% above the ten-year average), ruddy duck (38.9% above the ten-year average), and Atlantic brant (44.3% above the ten-year average).

The Finger Lakes Region portion of the survey was flown on January 28. Surveyors counted 44,458 Canada geese, 15,738 mallards, 1,931 American black ducks, 1,200 redheads, and 1,295 goldeneyes over-wintering in the Central New York/Finger Lakes Region. The total of 44,000 Canada geese observed were only a portion of the estimated 75,000 - 100,000 birds overwintering on the Finger Lakes. The unusually mild winter created different patterns of abundance and distribution for this year's survey. Virtually all bodies of water were open at the time of the survey and waterfowl were spread out on many small lakes, ponds, and agricultural fields that are not on the traditional survey route.

B). Spring and Fall Migration

The ducks and Canada geese which overwinter on Cayuga Lake often spend portions of milder winter days sitting on the ice or slush covering refuge impoundments. Unseasonably mild weather prevented ice from forming on refuge impoundments for much of the early winter of 1995. Approximately 20,000 Canada geese and several thousand mallards and American black ducks took advantage of the open water and were frequently observed resting on the impoundments. Over 100 tundra swans were also present during much of the period.

Spring migration began in earnest during the final two weeks of March when large numbers of waterfowl returned to refuge impoundments. Peak goose numbers on refuge pools during the spring push included 35,000 Canada geese and 10,000 snow geese. Most numerous duck species found on refuge pools during spring migration were mallard, wood duck, American black duck, northern shoveler, green-winged teal, ring-necked duck, canvasback, and bufflehead. The majority of the spring migrant waterfowl left the area during the last few days of April.

Fall migration descended upon the refuge in late September with the arrival of 5,000 Canada geese and several thousand ducks, dominated by mallards, green and blue-winged teal, and American widgeon. Waterfowl numbers gradually increased throughout the remainder of the autumn. The fall Canada goose peak occurred during late November and early December, with over 45,000 birds on refuge impoundments. Fall duck numbers for many species peaked in November. Over 75,000 ducks were recorded on the refuge during this period. The most common species were mallard, American black duck, American widgeon, gadwall, canvasback, ring-necked duck, and scaup. Large numbers of American coot were also observed on refuge pools during November.

Of particular interest throughout the fall waterfowl migration was the number and variety of birds using Tschache Pool. Tens of thousands of waterfowl could be observed on a daily basis feeding within the dense stands of umbrella sage, smartweed, *Bidens*, and cattail throughout the impoundment. At the peak, over 50,000 ducks were using the pool including green-wings, mallards, black ducks, wood ducks, pintail, widgeon, and gadwall. The species composition changed during the month from mostly green-wings (over 10,000) to mostly mallards and black ducks. Toward the end of November, as much of the pool was frozen over, numbers dwindled to 10 - 20,000 on a daily basis. Twenty to 25% of these were black ducks.

One last note about the fall migration was the presence of over 300 tundra swans on the refuge during early to mid December. The birds were observed on the Main Pool until ice-up.

C). Brood Counts

The first Canada goose brood of the season was recorded on April 25. The first mallard brood was spotted on May 12, and the first wood duck brood on May 13.

Waterfowl production at Montezuma was calculated by both our traditional method (broods observed during weekly waterfowl surveys) and the Bennett Survey method.

The Bennett Survey was conducted on June 13 and 15 during the first peak of waterfowl hatching on the refuge. The total area surveyed included Main Pool, Unit 17, North and South Spring Pools, and May's Point Pool.

The "traditional" survey method which consists of recording all waterfowl broods in the impoundments during the weekly waterfowl surveys were consistently recorded, with the first brood sighting (Canada goose) occurring on April 25. Again this year (as in past years), the traditional survey included more species than the Bennett survey. The traditional survey method is extrapolated to provide an estimate for the entire refuge. This extrapolation has always produced larger production figures than the Bennett's technique. Results of both survey methods are provided in Table G-1. Our records suggest the traditional survey is more accurate than the Bennett technique in the refuge's very large pools.

Total duck production for 1995 was very similar to 1994.

TABLE G-1

1995 WATERFOWL BROOD SURVEY - BENNETT'S TECHNIQUE

Species Observed	Different Broods	Total Broods	Estimated Number of Broods	Actual Number of Young Seen	Estimated Production
Mallard	12	12	35	78	228
Wood Duck	30	30	77	247	634
American Black Duck	1	1	7	8	56

* Bennett's Technique was conducted on 6/13/95 & 6/15/95.

* Estimated production equals (the actual # of young ÷ different broods) x the estimated # of broods.

1995 WATERFOWL BROOD SURVEY - TRADITIONAL METHOD

Species Observed	Actual Number of Broods	Estimated Number of Broods	Actual Number of Young Seen	Estimated Production
Canada Goose	42	53	221	279
Mallard	24	36	168	252
Blue-winged Teal	3	5	14	23
Wood Duck	70	105	609	914
Hooded Merganser	4	6	12	18
American Black Duck	2	3	13	20
Green-winged Teal	1	2	7	14
Gadwall	3	5	14	23

* For Canada geese, the estimated # of broods equals actual # of broods x 1.25.

* For ducks, the estimated # of broods equals actual # of broods x 1.5.

* Estimated production is equal to (the actual # of young seen ÷ the actual # of broods) x the estimated # of broods.

D). Wood Duck Nest Box Program

The wood duck nest box program at Montezuma has been in place for nearly two decades. Yearly monitoring of box use has aided the refuge in attaining a fairly accurate estimate of wood duck production from boxes. Natural cavities in suitable habitat appear to be abundant; however, we have no information on their use, locations, or predation rates, so overall production estimates must be considered conservative.

Wood duck nesting boxes from the previous nesting season are inspected, cleaned, and maintained in January and February each year. Results from the 1995 nesting season are not yet available. 1994 nesting season information is presented below.

Biologist Gingrich, with assistance from Outdoor Recreation Planner Smith, completed inspection and maintenance on 61 of the refuge's 121 wood duck nesting boxes. The remaining boxes were inspected by Dr. Paul Sherman (Cornell University). Information collected from all 121 boxes is used in Dr. Sherman's Research Management Study designed to assess the effects of nest box proximity and visibility on brood parasitism (dump nesting), nesting efficiency, and productivity of wood ducks.

The experimental design is a two-way ANOVA with three replicated blocks involving 120 nest boxes. There are 30 boxes in each of four treatments at Montezuma: (1) high visibility - low density; (2) high visibility - high density; (3) low visibility - high density, and (4) low visibility - low density. Boxes in the second and third treatments were erected in 1993; boxes in the first and fourth treatments have been in place for more than four years.

In 1994, 228 more ducklings hatched from the 121 experimental nest boxes than had hatched in 1993. Greater duckling production in 1994 was due primarily to greater egg hatchability overall, but especially among the low visibility boxes. On average, an egg laid in a low visibility box (i.e., treatments 3 and 4) was twice as likely to hatch as was an egg laid in a high visibility box (treatments 1 and 2). At least twice as many high visibility as low visibility boxes were parasitized, and three times as many eggs were left unhatched in high visibility boxes. Among the four treatments, low visibility, low density boxes (treatment 4) were the most productive (10.1 ducklings/box), and high visibility, high density boxes (treatment 2) were the least productive (1.2 ducklings/box). These results leave no doubt that parasitism can be reduced and productivity increased by

erecting hidden wood duck nest boxes on trees near brood habitat.

In 1994, as in 1993, the most recently erected boxes (i.e., treatments 2 and 3) were less often used, and parasitized, than the boxes that had been in place longer (treatments 1 and 4). This is unfortunate, because it means that "box age" is still a confounding variable in the experiment. It may take another year (or two) for box use to equilibrate among the four treatment blocks. Until this occurs, results from ANOVA analyses will be spurious. Nonetheless, we can already see that in both 1993 and 1994 nest box visibility was more important than density in affecting parasitism and productivity. In both years, in both the high and low density, low visibility boxes (treatments 3 and 4), minimum parasitism rates, numbers of eggs laid, and unhatched eggs per box were lower, and the proportion of eggs that hatched and duckling production per box were higher than in both the high and low density, high visibility boxes (treatments 1 and 2).

Dr. Sherman's research work with refuge wood duck boxes is ongoing (current plans are for the work to continue through the 1996 nesting season). A more complete summary of his work is presented in Section D.5.

4. Marsh and Water Birds

Several species of marsh and water birds may be found on refuge pools during the course of the year. The refuge's shallow pools fringed by emergent vegetation attract an abundance of great blue herons, green-backed herons, great egrets, black-crowned night-herons, Virginia rail, American and least bitterns, common moorhens, and pied-billed grebes.

Unusual sightings of marsh and water birds observed on the refuge during 1995 included: a horned grebe sighted on the Main Pool on March 28 and 29; two red-necked grebes observed on Tschache Pool on April 21; a glossy ibis sighted on the Main Pool on May 13; a glossy ibis was observed again on the refuge in mid-October on May's Point Pool; and the final rare sighting of the year occurred during the first week of November when a sandhill crane was observed on the mudflats of May's Point Pool.

Great blue herons again nested in the southern wooded edge of the Main Pool and on Maple Island. The nests are located in live trees, and the dense leaf cover obscures the majority of the nests throughout the breeding season. A late fall (post leaf drop) count revealed 50 nests. It is impossible to determine how many of these nests were active and fledged young during the breeding season.

Refuge Intern Steve Kahl conducted field surveys throughout the summer months to determine the status of the refuge's breeding rails, bitterns, and night herons. The most common rail species was Virginia rail, with many juveniles found. Very few sora rails were observed. Black-crowned night herons were common, production of 25-30 birds was estimated from nests located in the emergent vegetation fringing portions of the Main Pool. Other marsh and water birds observed nesting on the refuge in 1995 included green-backed heron, pied-billed grebe and American bittern. Of interest during 1995 was the large number of common moorhens produced on the refuge. Over 100 young moorhens were observed on Main and May's Point Pools. The number of young observed on May's Point Pool was particularly impressive. Over 75 of the juvenile common moorhens were sighted on May's Point Pool.

While not nesting on the refuge, double-crested cormorants are conspicuous on Main, Tschache, and May's Point Pools throughout the late summer and fall. The birds are commonly observed foraging on the abundant carp and brown bullhead populations in the pools.

5. Shorebirds, Gulls, Terns, and Allied Species

Gulls are conspicuous at the refuge. Herring, ring-billed, and great black-backed gulls are the most common species. The birds are opportunistic feeders and take advantage of foraging opportunities presented by winter-killed carp and brown bullheads after ice-out in March. Less common gulls observed at Montezuma during 1995 included Bonapart's, laughing, and lesser black-backed gulls. These species were observed sporadically in both the spring and fall.

Common and caspian terns were frequently observed during the fall drawdown of May's Point Pool. Both species used the exposed mudflats as a resting area between foraging flights over the other impoundments on the refuge. Least terns were infrequently observed on May's Point during the same time period.

American woodcock singing ground surveys were conducted on the refuge in early May. The survey routes are slightly modified versions of the national singing ground surveys conducted by the U.S. Fish and Wildlife Service's Office of Migratory Bird Management.

On May 1, the American Woodcock Singing Ground Survey was conducted on both the Unit 17 route and the North Spring Pool route. Biologist Gingrich and ORP Smith were the surveyors. Two American woodcock were heard on the Unit 17 route, and eight were heard on the North Spring Pool route.

These numbers were the same as last year, and higher than the average of 3.4 woodcock/10 sampling stations found throughout New York State.

Biologist Gingrich and Deputy Refuge Manager Lamoy both participated in the Service's National Singing Ground Survey. On May 9, Gingrich heard eight "peenting birds" on a survey route east of Lyons, New York. On May 4, a route near the Seneca Army Depot in Romulus, New York was surveyed by Lamoy. Two birds were recorded on the survey route.

Killdeer, spotted sandpiper, American woodcock, and common snipe are the only shorebird species that are common breeders on the refuge, although many other species are commonly observed during migration.

For the past several years, Montezuma has instituted a program of both spring (April - May) and fall (mid-August - late October) drawdowns of water levels on the 160-acre May's Point Pool, and more recently, on the 5-acre Benning Marsh Unit. This effort is designed to provide feeding and resting habitat for shorebirds during their annual migrations. We have had excellent success in attracting large numbers of shorebirds, and the viewing opportunities are very popular with upstate New York birding enthusiasts. We view our efforts at providing migratory shorebird foraging habitat as extremely important to the resource since the Montezuma Marsh Basin was historically the most significant migratory stopover for shorebirds in all of upstate New York.

During the late spring of 1995 migratory shorebird use at Montezuma was concentrated not on May's Point Pool or Benning Marsh but Tschache Pool. The Tschache Pool drawdown provided an immense area of mudflat habitat for migratory shorebirds during the last three weeks of May. Thousands of birds were observed working the mudflats over the weekend of the 20th and 21st. Rarer species included both willet and whimbrel. Of particular note was the presence of over 2,000 dunlin on the drained impoundment on May 21.

Both May's Point Pool and Benning Marsh were drawn down in mid-August to create mudflats and shallow water habitat for the fall migration. Both shorebird and waterfowl response to the drawdowns was immediate and spectacular. Throughout the drawdown, shorebird species diversity was especially impressive. Lesser and greater yellowlegs, killdeer, pectoral sandpipers, semipalmated sandpipers, and least sandpipers were most common. Rarer species included Hudsonian godwit, Baird's sandpiper, lesser golden plover, sanderling, Wilson's and red-necked phalaropes, ruff, and stilt sandpiper. Virtually every species of shorebird that migrates through central New York was represented and

recorded during the late summer and fall on May's Point Pool and Benning Marsh. Over two dozen species of shorebirds were recorded on the two units. Montezuma has certainly become one of the most critical inland migratory stopover points for shorebirds in the eastern United States.

The black tern has recently been listed as an endangered species in New York State and has been proposed as a candidate for listing as a federally endangered or threatened species.

1995 proved to be a historic year for black tern breeding success at Montezuma. For the first time since the mid 1980's, black terns successfully fledged young on the refuge. A ground search of May's Point Pool on June 1 revealed three active black tern nests with a total of ten eggs. Six adult black terns were observed during this site visit. A second visit to the area in mid-July found seven fledged juvenile black terns in the vicinity of the breeding colony.



One of three black tern nests found on May's Point Pool in 1995. (95-17; TAG)

6. Raptors

Other than the comments in Section G.2 concerning bald eagle and osprey use of the refuge, raptor populations underwent no noticeable changes in 1995. Census methods for this group consist of recording observations during other specific surveys and routine field work.

Red-tailed hawks and American kestrels were commonly observed throughout the year. Several breeding pairs of each species occur on and in the immediate vicinity of the refuge. American kestrels successfully nested in all three of the nesting boxes erected for their use.

Sharp-shinned and Cooper's hawks are not known to breed on the refuge. However, both species are occasionally seen during fall and winter. Eastern screech owls and great-horned owls are breeders and year-round residents. Northern harriers are commonly observed and breeding by this species was confirmed during 1995. Turkey vultures are commonly seen from March to November.

The refuge annually hosts several species of wintering birds of prey. The almost complete lack of snow cover during the winter of 1994-95 appeared to provide an abundance of easily-detected prey for this year's wintering raptors. Red-tailed hawks, rough-legged hawks, northern harriers, American kestrels, and snowy owls were all very conspicuous on the refuge throughout the winter months.

7. Other Migratory Birds

General observations, information from reliable refuge visitors, the annual Audubon Christmas Bird Count, and Breeding Bird Surveys conducted by Refuge Intern Steve Kahl constitute the principal survey methods used for these species.

The 1995 Montezuma Christmas Bird Count was conducted by members of the Owasco Valley Audubon Club on January 1, 1996. A grand total of 11,344 individual birds representing 60 species were recorded. Both the total number of individuals and the total number of species recorded were significantly lower than last year's record levels. Participants reported both cold weather and deep snow conditions as obvious contributors to the low count. Some of the more unusual sightings included: Carolina wren, northern mockingbird, and eastern meadowlark. Despite the relatively low overall numbers, new record highs were reported for wild turkey (14), eastern screech owl (13), tufted titmouse (25), and eastern bluebird (32). Unfortunately, due to the federal government shutdown,

participants in this year's count were denied access to the refuge proper. As many as five or six additional species were missed because of the refuge closure.

Steve Kahl (a student intern from the State University of New York College of Environmental Science and Forestry) assumed responsibility for monitoring the refuge's twenty-six bluebird nesting boxes throughout the 1995 breeding season. Two nest boxes were occupied by eastern bluebirds. A total of eleven young were fledged during three nesting attempts in the two nest boxes. All eleven eastern bluebird fledglings were banded by intern Kahl. Other species using the remaining boxes included tree swallows (by far the most common nester), and house wrens.

Refuge Intern Steve Kahl and NYSDEC Biological Technician Paul Hess participated in the International Migratory Bird Count on the refuge on May 13. One hundred twenty-six species were recorded, and 5,307 individuals were counted. Rarer sightings included Eurasian wigeons, surf scoters, glossy ibis, Carolina wrens, prothonotary warblers, and blue-winged warblers.

Refuge Intern Steve Kahl conducted a breeding bird survey. The primary purpose of the survey was to provide baseline information about the breeding passerine bird community of the refuge. The survey was a time-area type count based on the methodology specified by the Regional Office. Fifty points were established with an attempt to represent all the major habitat types and plant community types on the refuge. Counts were conducted three times at 38 points and twice at the remaining 12 points in June. The 12 remaining points were covered a third time by July 3rd. Uncommon to rare (for this part of the state) species found include northern harrier, sharp-shinned hawk, Cooper's hawk, Acadian flycatcher, brown creeper, winter wren, eastern bluebird, black-and-white warbler, mourning warbler, and purple finch. The ten most frequently found species (the number in parentheses is the number of points, out of 150 points, that the species was counted at) were: song sparrow (144), American robin (136), yellow warbler (118), common yellowthroat (112), red-winged blackbird (98), eastern wood-pewee (87), brown-headed cowbird (86), swamp sparrow (80), veery (66), and wood thrush (64).

Refuge Intern Kahl conducted field surveys throughout the summer to inventory the refuge's breeding bird species. Using criteria from the New York State Breeding Bird Atlas Project, a list was compiled of the refuge's bird species found and the highest category of breeding evidence observed. Another list was compiled of the bird species found and their presence/absence in each unit of the refuge. By the end of the summer evidence of breeding had been found

for 119 species, with breeding confirmed for 71! Confirmed breeders included northern harrier, common tern, black tern, pileated woodpecker, and cerulean warbler.

8. Game Mammals

A). White-tailed Deer

The 1995 firearms hunt was the eighth refuge gun hunt in the last 30 years. Archery hunting, permitted for most of that period, was only marginally successful in maintaining deer populations within acceptable limits. The firearms hunt was initiated to implement a more aggressive and proactive program of managing the refuge's deer population.

The objective of the hunt is to protect forested and scrub/shrub habitats by controlling the size of the refuge's pre-winter deer population. During severe winters the refuge serves as a yarding area for deer from a distance of eight to ten miles. The refuge's 2,000-acre tract of moist hardwood bottomlands and cattail swales provide escape cover not only for refuge deer, but also for those deer from adjacent, non-sheltered farmlands. The deer seek out the thermal protection afforded by the bottomland hardwoods and cattail marshes.

The large over-wintering deer population of the early and mid-1980s had a negative impact upon the overall vigor and diversity of many refuge plant communities. Several areas of the refuge's treed and/or shrubbed acreage were heavily browsed in past years. The refuge's deer hunts were implemented to reduce the deer population, and thus lessen the damage to the vulnerable plant communities.

The long, hard winters of the early 1990s and an increase in the number of deer harvested (resulting from implementation of the firearms hunt) appear to have reduced white-tailed deer numbers on and around the refuge. This trend is supported by several years of data collected from deer harvested on the refuge since implementation of the firearms hunt.

A total of 74 white-tailed deer were harvested by hunters during the 1995 refuge season (November 1 through December 16). Archery hunting accounted for 16 deer, with shotgun hunters removing an additional 58. Fifty (50) of the 74 deer harvested were examined by refuge personnel at the hunter Check Station. Information collected on each deer included sex, age, antler beam diameter, total number of antler points, and fawn weight. Table G-2 summarizes the

sex and age breakdown of the 50 deer examined at the Check Station.

TABLE G-2. SUMMARY OF CHECK STATION DATA FOR THE WHITE-TAILED DEER HUNT ON THE MONTEZUMA NATIONAL WILDLIFE REFUGE, 1995.

Sex	<u>Age Classes</u>					Number Examined
	Fawn	1 1/2 Years	2 1/2 Years	3 1/2 Years	4 1/2+ Years	
Male	9	19	4	0	0	32
Female	6	7	3	1	1	18
Totals	15	26	7	1	1	50

Table G-3 summarizes the physical condition data gathered on the 23 adult male deer and 15 fawns (both male and female) examined at the Check Station. For adult male deer, all antler points longer than one inch were counted and the diameter of the antler beam was measured with calipers one inch above the base of the antler burr.

TABLE G-3. SUMMARY OF PHYSICAL CONDITION DATA AND FAWN WEIGHTS FOR DEER TAKEN ON THE MONTEZUMA NATIONAL WILDLIFE REFUGE, 1995.

Age Class	Average Beam Diameter (mm) ¹	Average Number Of Antler Points ²	Average Fawn Weight (lbs)
Fawn (female) (n = 6)	--	--	58.2
Fawn (male) (n = 9)	--	--	64.9
1 1/2 Years (n = 19)	21.42	4.74	--
2 1/2 Years (n = 4)	28.25	7.25	--

¹ The diameter of the antler beam was measured with calipers one inch above the base of the antler burr.

² All antler points longer than one inch were counted.

Table G-4 provides a ten-year summary of information on deer examined at the hunter Check Station from 1986 through 1995. Although sample sizes are small, both yearling antler beam diameters and fawn weights have increased since 1986 (as illustrated in Figures G-1 and G-2). These two measurements of herd health indicate that current hunts appear to be succeeding in reducing deer numbers to levels adequate to insure the overall vigor of the refuge's deer population, and consequently, provide protection of habitats for other wildlife species.

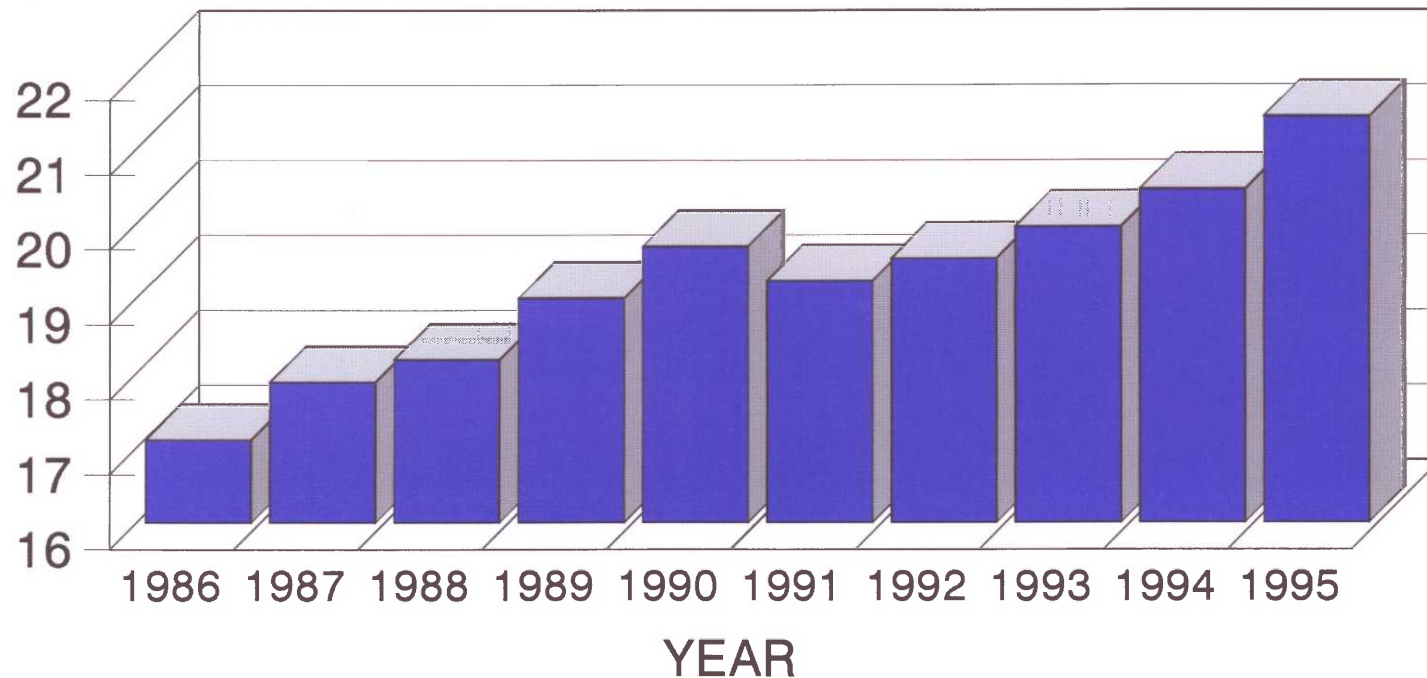
TABLE G-4. TEN-YEAR SUMMARY OF MEAN YEARLING ANTLER BEAM MEASUREMENTS AND DRESSED FAWN WEIGHTS FOR DEER HARVESTED ON THE MONTEZUMA NATIONAL WILDLIFE REFUGE.

Hunt Year	Average Yearling Beam Diameter (mm) ¹	Average Dressed Fawn Weight (lbs)	
		<u>Female</u>	<u>Male</u>
1986	17.11 (n=9)	--	--
1987	17.88 (n=8)	48.8 (n=5)	48.2 (n=6)
1988	18.18 (n=22)	48.7 (n=7)	54.0 (n=15)
1989	19.00 (n=24)	48.8 (n=14)	55.3 (n=18)
1990	19.69 (n=16)	55.3 (n=4)	57.0 (n=14)
1991	19.23 (n=30)	57.5 (n=11)	61.0 (n=24)
1992	19.53 (n=15)	54.0 (n=13)	55.6 (n=19)
1993	19.95 (n=21)	52.1 (n=16)	62.9 (n=19)
1994	20.45 (n=11)	59.8 (n=9)	62.0 (n=10)
1995	21.42 (n=19)	58.2 (n=6)	64.9 (n=9)

¹The diameter of the antler beam was measured with calipers one inch above the base of the burr.

Montezuma National Wildlife Refuge

Mean Yearling Beam Diameters



■ BEAM DIAMETER (mm)

Figure G-1. Mean Yearling Beam Diameters of White-tailed Deer Harvested on Montezuma N.W.R. 1986-95

Montezuma National Wildlife Refuge

Average Dressed Fawn Weights

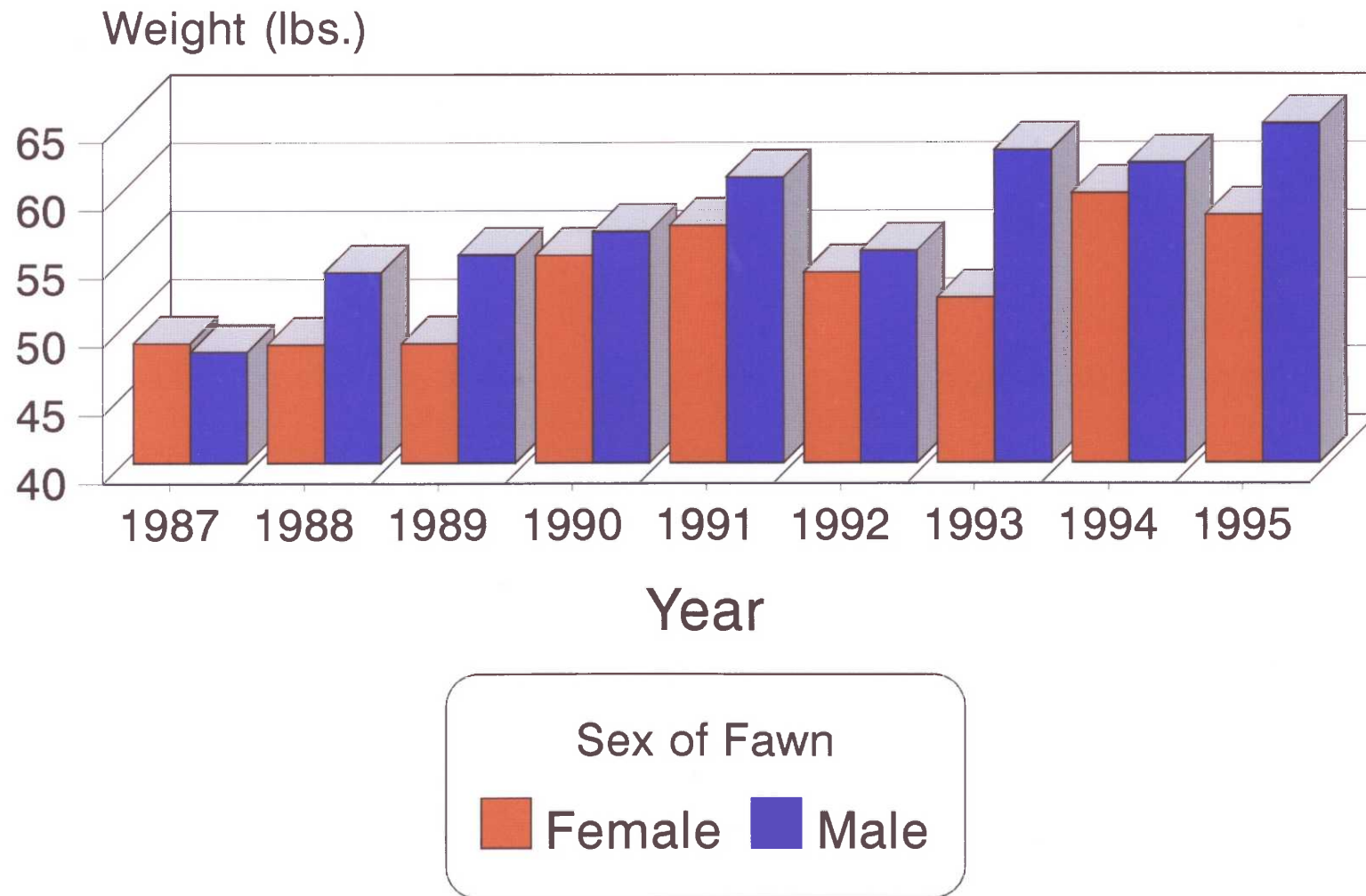


Figure G-2. Average Dressed Fawn Weights of White-tailed Deer Harvested on Montezuma N.W.R. 1987-95

B). Raccoon

The raccoon has historically been very abundant in the uplands and throughout the cattail marshes of Montezuma Refuge. We know they prey heavily on waterfowl nests and have always wished for a much reduced population. Commercial trapping has been permitted, but the annual take has been very small in recent years, rarely exceeding 50 animals. Low fur prices have resulted in virtually no interest and very little incentive to trap raccoons. The extremely low level of trapper harvest in recent years has been insignificant in terms of reducing the raccoon population on the refuge.

In recent years the on-going rabies outbreak in central New York appeared to decimate raccoon numbers on the refuge.

Many sick and dead animals were observed on and near the refuge. Despite the increased mortality from rabies, the raccoon population is still higher than we would like to see, and the animals still pose a significant threat to nesting waterfowl.

C). Muskrat

Portions of the emergent cattail marsh which historically were some of the most productive muskrat habitat on Montezuma have been significantly degraded in recent years by encroachment of purple loosestrife and phragmites. Muskrat populations have also been reduced by the necessity of using winter drawdowns to remove carp from most refuge impoundments. These factors have combined to reduce the muskrat harvest by refuge trappers from historical highs of over 10,000 animals annually to under 500. During 1995 the refuge muskrat population appeared higher than in recent years. Numbers of observable muskrat houses were significantly higher on May's Point, Main, and Tschache Pools.

An index of the population was obtained in the past by a house survey each winter, although the accuracy of this technique was greatly influenced by the presence or absence of snow cover. This technique has been discontinued in recent years because of the reduced muskrat population and the tendency for many of the remaining animals to use bank dens rather than houses.

D). Other Mammals

Beaver were seen throughout the year and appear to be flourishing on many areas of the refuge. Although they

occasionally attempt to plug the water control structures in Unit 17 and at the north end of the Cayuga Lake Connector Ditch, they have not yet created significant problems. We have no reliable estimate of beaver population size, although we have observed nothing to indicate a change in the population from previous years.

No changes were noted in cottontail rabbit, grey squirrel, Virginia opossum, woodchuck, and red fox populations. No noticeable trends were observed which indicated anything but stable populations for each of these species. The number of eastern coyote sightings on the refuge increased during 1995. The animals were frequently reported in the vicinity of Tschache and May's Point Pools.

10. Other Resident Wildlife

The wild turkey population has been increasing in central New York in recent years. This past year, many more sightings of eastern wild turkeys were reported on the refuge than in previous years. Although limited upland acreage and a lack of mast producing trees appear to be limiting factors within the boundary of the refuge proper, the wild turkey population is nevertheless increasing on and adjacent to the refuge. Large flocks of over thirty birds are seen frequently throughout the fall and winter months. Hens are now beginning to nest on and immediately adjacent to the refuge. Several young turkey broods of ten to fourteen poults were observed on the refuge during the summer of 1995.

Montezuma provides, at best, only marginal habitat for ruffed grouse. No drumming males were heard by refuge staff and only a few individuals were observed during the year.

11. Fisheries Resource

Montezuma offers only limited sport fishing opportunities. In order to minimize disturbance to migratory birds, fishing is confined to non-impoundment waters immediately adjacent to the refuge boundary on the New York State Barge Canal.

The refuge maintains two fishing access sites (May's Point and Armitage Road), and operates under a cooperative agreement with the New York State Department of Environmental Conservation to maintain a third site used for boating access to the Cayuga-Seneca Barge Canal. A total of 2,400 feet of bank access for fishing exists at the three sites.

In the spring of the year there is a small run of brown bullhead and carp, and fishing opportunity exists where the fish congregate on the canal-side outfall of the Seneca Spillway on the Main Pool. Northern pike, sunfish, crappie, brown bullhead, and carp are the most common species caught at the refuge's fishing access points.

12. Wildlife Propagation And Stocking

Mike Haramis (Patuxent WRC) supervised the release of 12 canvasbacks on the Main Pool on July 27. The birds were raised on enclosed outdoor ponds at Patuxent WRC as part of a long-term research project. Instead of sacrificing the birds at the conclusion of the project, Haramis obtained the necessary Federal and New York State permits to transport and release the birds. The ducks were veterinarian-certified as healthy and disease free.

A total of 252 canvasbacks, 5 redheads, and 80 American black ducks have been released on the refuge since 1992 by researchers from Patuxent WRC and the National Zoological Park. Who knows what may happen in the future. The refuge appears to have adequate habitat for breeding canvasbacks and/or American black ducks. A few American black ducks are produced on the refuge each year and canvasback breeding has occurred at Montezuma in the past, with the most recent brood produced in 1981. Table G-5 provides a summary of duck species and numbers released on the refuge since 1992.

TABLE G - 5

SUMMARY OF CANVASBACK, AMERICAN BLACK DUCK, AND REDHEAD RELEASES ON MONTEZUMA NWR, 1992 - 1995

Year of Release	Species	<u>Number Released</u>		<u>Total</u>
		Male	Female	
1992	Canvasback	36	30	66
1993	Canvasback	50	44	94
	Redhead	--	5	5
1994	Canvasback	47	33	80
	American Black Duck	25	55	80
1995	Canvasback	5	7	<u>12</u>
Grand Total				337

15. Animal Control

Raccoons have historically been a problem during preseason waterfowl banding operations at the refuge. The animals often find baited areas and discourage birds from approaching the banding site, rendering it useless for waterfowl trapping. If raccoons discover the site after the traps are set and birds are confined in the holding wings, there is the possibility that the animals will maim and/or kill the captured ducks.

During 1995, ten raccoons were captured in traps at the banding sites during banding operations and removed to other areas of the refuge. The success of this raccoon removal program is reflected in the success of our banding program. During the last five years over 5,800 ducks were banded on the refuge and not one bird was lost to depredation.

16. Marking and Banding

Preseason waterfowl banding began on August 28 and ended on September 29. The refuge's banding quotas were exceeded for mallards (300 total, 75 each age and sex) and wood ducks (300 total). The refuge quota of 75 American black ducks was not achieved, with only 40 being banded.

All birds were captured using three-compartment walk-in traps (cloverleaf/confusion design). Whole kernel corn was used as bait at four land sites adjacent to the Main Pool. A total of 1006 ducks were banded during ten trap-nights of effort.

Several scout groups, college students, a high school BOCES class, and many refuge volunteers assisted with the waterfowl banding program. A total of 125 students and 25 adults participated this year. Their help was very much appreciated.

Banding totals for each species are summarized in Table G-6.

TABLE G - 6

1995 PRESEASON WATERFOWL BANDING SUMMARY MONTEZUMA NATIONAL WILDLIFE REFUGE					
SPECIES	HYM	AHYM	HYF	AHYF	GRAND TOTAL
MALLARD	116	263	107	83	569
AMERICAN BLACK DUCK	22	11	5	2	40
WOOD DUCK	123	97	102	68	390
NORTHERN PINTAIL	0	2	2	1	5
AMERICAN WIGEON	0	1	1	0	2
GRAND TOTAL					1006

<u>Species Banded</u>	<u>Total Immature/Adult</u>	<u>Percent Immature</u>
Mallard	223/346 = 0.64	223/569 = 39. %
Wood Duck	225/165 = 1.36	225/390 = 57. %
American Black Duck	27/13 = 2.08	27/40 = 67. %

Throughout the month of February several staff members assisted New York State Department of Environmental Conservation Region 8 Biologists with a special mallard/American black duck winter banding project on Seneca Lake. Nearly 500 birds were captured, leg banded, and released during the effort. The banding project provided an excellent opportunity for refuge personnel to work with and learn from their state counterparts, and vice versa.

H. PUBLIC USE1. General

The public use facilities and programs at Montezuma include the 3.5-mile Wildlife Drive, 2-mile Esker Brook Trail, Visitor Center, observations towers and platforms, fishing access sites, hunting programs, trapping programs, educational programs and materials, guided tours and special programs. Tables H-1 and H-2 provide visitation profiles for 1993-1995.

FIGURE H-1

REFUGE VISITATION 1993-1995

	<u>1993</u>	<u>1994</u>	<u>1995</u>
Wildlife Observations			
Wildlife Drive	61,700	78,000	76,900
Towers/Decks	19,700	17,200	17,000
Trails	8,000	12,000	10,800
Guided Walks/Tours	350	600	750
Photography	500	400	400
SUBTOTALS	90,250	108,200	105,850
Visitor Center	14,000	17,000	17,000
Special Programs	500	200	900
Informational Visits - Office	350	350	250
Environmental Education (on-site)			
Students	2,000	2,500	3,700
Teachers	300	300	350
SUBTOTALS	2,300	2,800	4,050
Environmental Education (off-site)*			
Students	3,000*	2,200*	4,000*
Teachers	250*	200*	250*
SUBTOTALS	3,250*	2,400*	4,250*
TOTAL EE	5,550*	5,200*	8,300*
Hunts			
Waterfowl	200	200	200
Archery	900	800	550
Firearms	800	650	800
SUBTOTALS	1,900	1,650	1,550
Trapping	100	100	100
Fishing	24,200	7,000	4,100
YEARLY TOTALS	133,750	137,300	133,800

*Numbers not included in total yearly refuge visits.

TABLE H-2
MONTHLY VISITATION

<u>Month</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>
JANUARY	500	200	200
FEBRUARY	100	100	100
MARCH	500	400	13,000
APRIL	7,800	14,000	19,800
MAY	16,100	16,000	16,600
JUNE	18,700	7,000	12,100
JULY	20,500	8,000	11,700
AUGUST	20,100	17,000	15,300
SEPTEMBER	19,700	19,000	18,100
OCTOBER	21,200	29,000	18,900
NOVEMBER	8,100	23,000	6,000
DECEMBER	450	3,600	2,000
TOTALS:	133,750	137,300	133,800

A close look at the monthly visitation reveals a significant decrease in visitation during October and November. October's decrease can be attributed to a rainy month that produced poor conditions for wildlife observation. Additionally, the loss of five waterfowl hunt days (discussed further in section H-8) also attributed to the decreased October visitation.

November's visitation decrease was partially the result of winters early arrival, but the government furlough also attributed to the decrease. All refuge hunt programs (waterfowl and deer) were affected by the shutdown. An estimated 250 hunt visits were lost during that period.

2. Outdoor Classrooms - Students

The number of students visiting the refuge continued to grow in 1995. Greater volunteer involvement in program presentations allowed the refuge to accommodate the increased number of school group program requests. Topics for school group presentations included: endangered species, migration, purpose and management of Montezuma, careers with the USFWS, wetland functions, animal adaptations and habitat comparisons.

A summary of the refuge's Environmental Education efforts is provided in Tables H-3 to H-6.

TABLE H-3
TOTAL ENVIRONMENTAL EDUCATION

	# OF STUDENTS	# OF TEACHERS
On-site	3,670	352
Off-site	4,015	237
TOTAL	7,685	589

TABLE H-4
ENVIRONMENTAL EDUCATION - ONSITE

	# OF STUDENTS	# OF TEACHERS
Elementary School	769	136
Middle School	1,377	150
High School	512	34
College	1,005	32
TOTAL	3,670	352

TABLE H-5
ENVIRONMENTAL EDUCATION - OFFSITE

	# OF STUDENTS	# OF TEACHERS
Elementary School	1,063	68
Middle School	2,360	138
High School	295	30
College	60	1
TOTAL	4,015	237

The largest increase in the environmental education program involved the number of students using the refuge as a true outdoor classroom. In 1995 the refuge provided facilities, lesson plans, equipment, and program assistance for the 1,000 students who participated in the outdoor classroom lessons. Table H-4 illustrates the recent growth of true outdoor classroom activities.

TABLE H-6
STUDENTS USING OUTDOOR CLASSROOM SITES

Year	Number Of Students
1989	0
1990	0
1991	0
1992	0
1993	130
1994	500
1995	1,000

Highlights of our outdoor classroom pursuits include:

All the sixth and seventh grade students at Newark Middle school spent an entire day on the refuge conducting lessons at Esker Brook Trail, South Spring Pool Platform, and Tschache Pool. A total of 480 students participated in the field trips to the refuge. Because of the success of this program, the school now budgets for the field trips and the lessons are part of the middle school science curriculum.

The local Mynderse Academy Middle and High Schools have also increased their use of the refuge's educational facilities. This year 120 seventh grade students and 150 tenth grade students used the refuge as their outdoor classroom.

Several scout groups, college classes, and a high school class participated in the refuge's waterfowl banding program. Most older students and a few younger ones chose to age and sex birds themselves. All 125 students learned how and why we band ducks.

This was the first year West Genesee Middle School used the refuge's outdoor classroom. The 120 sixth grade students

gathered information at the Visitor Center, Esker Brook Trail, and Tschache Pool.



Students conducting field lessons at South Spring Pool. (95-18; AF)

The refuge again assisted with the environmental education efforts of other agencies. Joint environment education ventures in 1995 included:

Central New York Envirothon: (sponsored by several area Soil and Water Conservation Districts) ORP Smith and Refuge Volunteer Ann Foland participated in the Regional Envirothon on April 27 and 28 at Roger's Environmental Education Center. Fifty teams (275 high school students) competed in the program. The top 3 teams advanced to the State competition. Smith and Foland prepared and presented the wildlife exam for the Regional competition.

Cayuga County Conservation Days: (organized by the Cayuga County Cooperative Extension) ORP Smith and Refuge Volunteer Ann Foland spent September 19 and 20 at the Cayuga County Conservation Days. The event exposed sixth grade students to 8 conservation/environmental topics (stations). the students rotate to each station for 15 minutes presentations. The refuge's station demonstrated wetland benefits to 440 students during the 2-day event.

Ontario County Conservation Days: (organized by Ontario County Cooperative Extension) ORP Smith and Refuge Volunteer Margaret Mckinney travelled to the Finger Lakes Community College on September 26 and 27 for the Ontario County Conservation Days. The same wetlands demonstration was presented to 640 Ontario County sixth grade students.

Onondaga County Environmental Field Days: (organized by Onondaga County Soil and Water Conservation District and Green Lakes State Park) On October 3 and 4, ORP Smith and Refuge Volunteer Ann Foland travelled to Green Lakes State Park for Onondaga County's Environmental Field Days. On October 3, Ann presented ten 20-minute programs on bird adaptations and migration to 400 sixth grade students. ORP Smith presented 20 programs on wetland values to 800 students during the 2-day event.

Refuge Staff and Volunteers also travelled to several school in 1995. Offsite school programs were as follows:

<u>Date</u>	<u>School</u>	<u>Grade</u>	<u># of Students</u>	<u>Topic</u>
2/4	Wetzel Rd. Elementary	5-6	20	Science Fair
2/8	Newark Elementary	4	25	Endangered Species
2/15	Clyde Elementary	4	95	Wildlife of Wayne County
2/17	Romulus High School	10	6	Careers
2/28	Seward Elementary	4	155	Bird Adaptations
3/29	Wetzel Rd. Elementary	1-6	450	Endangered Species
4/4	Fayetteville-Manlius High School	10	35	Endangered Species
4/5	St. Patrick's Elementary	K-1	75	Migration
4/10	St. Mary's Elementary	4	15	Bird Adaptations
5/16	Frank Knight Elementary	1	25	Reading Week
6/27	Bayberry Girl Scout Camp	6	30	Sights & Sounds of Summer

<u>Date</u>	<u>School</u>	<u>Grade</u>	<u># of Students</u>	<u>Topic</u>
7/12	Bayberry Girl Scout Camp	6	115	Endangered Species
9/20	St. Patrick's Elementary	K-1	60	Migration
9/22	Moravia High School	10	15	Wetlands
10/23	Cayuga Elementary	1-3	75	Bird Adaptations
11/6	Frank Knight Elementary	1	180	Animals of Meadows

Colleges travelling to the refuge during 1995 included:

Cornell University
 Wells College
 SUNY-Morrisville
 SUNY-Oswego
 SUNY-Cortland
 SUNY-Cobleskill
 SUNY-Binghamton
 SUNY-College of Environmental Science &
 Forestry at Syracuse
 Paul Smith College
 Binghamton University
 Finger Lakes Community College
 Elmira College
 Cayuga Community College
 Ulster Community College
 University of Rochester
 Tompkins-Cortland Community College
 Ithaca College
 Hobart-William Smith College

3. Outdoor Classroom - Teachers

Approximately 400 educators brought their students to the refuge in 1995. A total of 35 educators travelled to the refuge for workshops this year. The New York State Outdoor Education Association (NYOEA) held it's annual conference in Waterloo, New York (less than 10 miles from the refuge). On Sunday October 10, 20 participants travelled to the refuge for a workshop on the outdoor classroom efforts of the refuge.

The refuge hosted a PROJECT WILD workshop on October 14. The workshop was sponsored by Cayuga County's Cooperative Extension and a total of 15 educators participated in the program.

ORP Smith provided technical assistance to Frank Knight Elementary School for the annual Environmental Awareness Week (November 1-9). Smith prepared information sheets, lesson plans, films/videos, and display cases of birds.

4. Interpretive Foot Trails

Esker Brook Nature Trail is the refuge's only foot trail. Approximately 11,000 people walked the 2-mile trail during 1995. An additional 1,000 students used Esker Brook Trail's habitats for environmental education activities.

Major improvements to the trails were accomplished during the summer of 1995. Inmates from the Butler Correctional Facility worked with ORP Smith on woodchipping nearly two miles of the trail. Interpretive signs were also installed during the inmates 3-week tour of duty at Esker Brook.



One of the new interpretive signs installed along Esker Brook Trail. (95-19; TAG)

To reduce potential conflicts, the trail was closed to nonhunting visitors during the refuge's archery and firearms deer hunts (November 1 - December 16).

5. Interpretive Tour Routes

The Wildlife Drive continues to be the most popular attraction on the refuge. More than 76,900 people travelled the 3.5-mile route in 1995. The Wildlife Drive provides excellent opportunities for viewing and photographing wildlife from one's vehicle.

The Wildlife Drive brochure corresponds to numbered posts along the Drive and provides self-guided interpretive information about ecological concepts and management of refuge habitats.

Inclement weather and poor road conditions resulted in the closure of the Drive to vehicles January, February, and most of December.

6. Interpretive Exhibits/Demonstrations

Refuge Volunteer Margaret Mckinney constructed an interpretive display board for the refuge Visitor Center. Using a piece of paneling, wallpaper paste, felt, and velcro, Margaret created a seasonal exhibit that provides information on such topics as life of a rotting Log, plant galls, pollination, bird nests, seed dispersal, etc... The display board was extremely popular and a great addition to the existing interpretive exhibits in the Visitor Center.

The refuge has several home-made portable exhibits that are used throughout the year for off-site events. Exhibits for off-site events include: "The Northern Montezuma Wetlands Project", "Bald Eagles at Montezuma...An Endangered Species Act Success Story", "Wood Duck Nest Box Display", and "Wetlands... We Need Them".

The Northern Montezuma Wetlands Project exhibit was displayed during Winterfest (February 11-12). The weekend event was held at Cayuga Lake State Park and approximately 300 people attended.

Refuge Volunteers Kevin Holcomb and Carol Clark staffed the Bald Eagles at Montezuma... and the Northern Montezuma Wetlands Project exhibits at the Cayuga Community College during Cayuga County's Earth Day Celebration. The event was attended by approximately 250 people.

Southern Cayuga Elementary School used the Bald Eagles at Montezuma...exhibit for their Earth Day Celebration. The exhibit was enjoyed by 150 students, teachers, and parents.

The "Bald Eagles at Montezuma..." exhibit was displayed at the SPCA's animal fair. The event was held at the Waterloo Fire Department and attended by 150 people.

On Saturday, June 3, Refuge Volunteers Kevin Holcomb and Maiken Holmes staffed the Wood Duck Nest Box exhibit at the Family Forest Fair in Elbridge, New York. Approximately 150 people stopped at the refuge exhibit.

The refuge provided the Northern Montezuma Wetlands Project exhibit, a TV/VCR, and several videos for the New York State Department of Environmental Conservation's display at the Empire Farm Days (August 8, 9, and 10). Secretary Babbitt's visit limited our assistance in staffing the exhibit to two of the three days. An estimated 75,000 - 100,000 people visited the 1995 Farm Days.

On September 9, Refuge Volunteer Kevin Holcomb staffed the Northern Montezuma Wetland Project exhibit at the 50th anniversary celebration of Cayuga County's Soil and Water Conservation District. Approximately 75 people learned about the expansion project during the event.

On the evening of November 6, Maintenance Mechanic Flanders staffed the Bald Eagles at Montezuma...exhibit at the Frank Knight Elementary School's Parents Night. Parents Night was the concluding event for the School's Environmental Awareness Week. In addition to the refuge's exhibit, students displayed their individual and class projects (artwork, stories, bird houses, etc...).

7. Other Interpretive Programs

In an effort to increase public awareness and interest in wildlife and refuge issues, the refuge used guided bird tours, programs for the general public, and program presentations to groups both on and off the refuge.

Guided Bird Tours:

Refuge Volunteers led 26 guided bird tours this year. A total of 750 people (an average of 29 per tour) participated in the tours that focused on birds, wetland ecology, and refuge management.

Programs For The General Public:

Naturalist Dave Spier presented a slide program entitled "March Trails" in the Visitor Center on March 22. Forty three people attended the evening program.

On April 19, ORP Smith presented an evening program for the public on the Endangered Species Act. The program was attended by 15 people.

Dr. Robert Chambers, Professor of Wildlife Ecology and Management at the State University of New York, College of Environmental Science and Forestry at Syracuse, presented a woodcock program on Wednesday evening, May 24. The program began in the Visitor Center and concluded in the field, where all 27 attendees heard peenting woodcock, as well as observed their aerial display.

On Wednesday evening, September 13, Dr. Paul Sherman, Professor of Neurobiology and Animal Behavior at Cornell University presented a program on the biology and behavior of nesting wood ducks. Dr. Sherman's program focussed on his research into the relationship between nest box placement and nest hatchability. A total of 20 people attended the program.

June Summers, a Volunteer with the New York River Otter Restoration Project, presented a program on the Otter Restoration Project on Saturday, September 23. A total of 32 people attended the program.

On Wednesday evening, September 27, a program on the biology and behavior of Coyotes was presented by Dr. Robert Chambers. Dr. Chambers, a Professor of Wildlife Management and Ecology at the State University of New York College of Environmental Science and Forestry at Syracuse, presented the program to 80 people.

Group Presentations:

In addition to the school group presentations, the refuge provided programs to over 1,000 people in 1995, including the following:

The Society of Wetlands Scientists held a meeting in the refuge Visitor Center on April 1. Fifty people attended the meeting which included the following presentations:

- Montezuma National Wildlife Refuge (ORP Smith).

- Northern Montezuma Wetlands Project (Dave Odell, New York State Department of Environmental Conservation Project Coordinator).
- Federal Wetlands Restoration Efforts (Carl Schwartz, USFWS Private Lands Coordinator for New York State).
- Biological Control of Purple Loosestrife (Dr. Bernd Blossey, Cornell University).

Lamoy was the luncheon speaker at the Canandaigua Kiwanis Club on April 18. About 75 people were in attendance.

Valley Forge Audubon travelled to Montezuma on April 30. The fifty members received a refuge program, followed by a guided tour with Refuge Volunteer LaRue St. Clair.

ORP Smith presented a program for 15 representatives of AAA on May 11. The group was touring the Finger Lakes Region, gathering information for their tourist information guides.

The Southern Cayuga Seniors visited the refuge on May 13. ORP Smith presented a refuge program in the Visitor Center and fielded questions about the Northern Montezuma Wetlands Project. Following the program, Refuge Volunteer (and Southern Cayuga Seniors member) Larue St. Clair led them on a guided tour of the refuge.

Refuge Manager Hocutt spoke to 25 Cornell University Alumni on July 7, 1995. Following Hocutt's program the group received a guided tour of the refuge from long-time refuge friend and Cornell Professor Charles Smith.

On July 18, Hocutt provided a management tour by vehicle and airboat for Bob Michalovic, former New York State Chairman of Ducks Unlimited, and Ed Fiorino, former President of Lake Plains Waterfowl Club. Both men are major players in New York State waterfowl circles.

On July 31, Hocutt did a 30-minute taped interview with Margaret Barker, Outreach Coordinator for the Cornell University Laboratory of Ornithology. The topic, Wetland Values and Outreach Considerations, will be the subject of a paper Barker is writing. Hocutt also took Barker on an airboat and vehicular tour of the refuge.

Three tour bus group programs were presented to 100 people during the month of August.

ORP Smith presented a program to 40 senior citizens in the refuge Visitor Center on September 6. The seniors were on a bus tour of the Finger Lakes Region.

Refuge Manager Hocutt spoke at the Genesee Ornithological Society's meeting in Rochester, New York on October 11.

Thirty-five people learned about the management of National Wildlife Refuges, especially Montezuma.

On October 12, Refuge Manager Hocutt spoke at the Rochester Birding Association's meeting. Refuge management policies were discussed with 40 people.

The same management program was provided to the Genesee West Audubon Society by Refuge Manager Hocutt on October 25. Thirty people attended the program.

8. Hunting

Hunting opportunities provided at the refuge include waterfowl hunting and white-tailed deer (both archery and firearms). The waterfowl hunt has changed very little over the years, but the deer hunts continue to be modified in an effort to simplify them and to reduce the costs of administering the deer hunts. 1995 proved to be a confusing year for all refuge hunts as Mother Nature and politics affected all the scheduled seasons (see Table H-7).

TABLE H-7

SUMMARY OF THE 1995 REFUGE HUNTING SEASONS

	Waterfowl	Archery	Firearms
Scheduled Season	October 19 - November 18	November 1-18 December 13-16	November 20-25 December 2-12
Scheduled # of Days	14	19	15
Actual Season	October 31 - November 11	November 1-13 December 13-16	November 21-25 December 2-12
Actual # of Days	6	14	14
# of Lost Hunt Visits *	125** 90***	30***	115***

* Estimation based on similar days during past seasons.

** Losses attributed to water shortage.

*** Losses attributed to Government shutdown in November.

Waterfowl Hunting:

During the refuge season, waterfowlers are permitted to hunt Tschache Pool on Tuesdays, Thursdays, and Saturdays. As addressed in the Annual Hunt Program, the 1995 waterfowl season was dependent upon the availability of water in late summer and early autumn to refill Tschache Pool following a scheduled summer drawdown of the impoundment. In late September, the refuge officially put the waterfowl season "on hold" because of the low water level resulting from the drawdown and the drought conditions of 1995.

In a 24-hour period (October 21-22), the refuge received three and a quarter inches of rain that ended the low water level problem. A news release was issued to inform hunters the refuge waterfowl season would begin on Tuesday, October 31.

Waterfowlers were able to get in 6 days of hunting before November's government shutdown ended their season 3 days early. A season total of 169 hunt visits were made by 97 hunters and 423 ducks were harvested. The Canada Goose season was closed in accordance with Atlantic Flyway Canada Goose Season regulations.

The summer drawdown of Tschache Pool paid off for hunters as the average of 2.5 birds per hunter was a refuge record for this 27-year old program. Additionally, hunters, amazed by the numbers and variety of birds using Tschache Pool, claimed they had never seen so many birds attracted to one area before.

Waterfowl hunters are charged a \$10 per reservation hunt fee and a total of \$965 dollars was collected for the 1995 season.

Prior to the waterfowl hunting season, Refuge Maintenance Mechanic Flanders presented two New York State Waterfowl Identification Classes in the refuge Visitor Center. A total of 45 people participated.

Further information on the refuge waterfowl hunt is provided in tables H-8 & H-9.

TABLE H-8
MONTEZUMA NWR WATERFOWL HUNT HARVESTS

Species	1990	1991	1992	1993	1994	1995
Mallard	155	185	191	149	117	274
Canada Goose	110	76	29	27	25	0
Green-winged Teal	185	80	32	25	41	60
American Black Duck	47	44	39	39	16	52
Northern Pintail	11	8	3	6	4	8
Common Merganser	37	8	17	25	21	0
Gadwall	4	1	11	7	2	2
Blue-winged Teal	6	2	0	0	1	0
Northern Shoveler	7	1	0	0	0	2
American Wigeon	0	1	3	2	4	11
Wood Duck	4	0	6	1	3	13
Hooded Merganser	0	0	8	14	15	0
Brant	0	0	0	0	0	0
Snow Goose	0	0	0	0	0	0
Bufflehead	0	0	0	0	0	0
Other	3	0	1	3	1	1
TOTAL HARVEST	569	406	340	298	250	423

TABLE H-9

SEVEN-YEAR COMPARISON OF THE REFUGE WATERFOWL HUNT PROGRAM

	1989	1990	1991	1992	1993	1994	1995
Number Of Days	10	10	10	13	10	13	6
Number Of Hunters	152	N/A	146	135	119	127	97
# Of Hunt Visits	315	293	267	263	208	247	169
% Of Reservations Used	N/A	N/A	N/A	62%	65%	68%	83%
Number Of Birds	515	569	406	341	298	250	423
\bar{X} # Birds Per Hunter	1.6	1.94	1.52	1.29	1.43	1.01	2.50
Number Of Cripples	N/A	N/A	N/A	73	54	68	94
Cost Of Hunt	\$4,701.00	\$2,683.12	N/A	\$1,935.14	\$1,954.14	\$2,870.39	\$1,946.18
Cost Per Hunter	\$ 30.92	N/A	N/A	\$ 14.33	\$ 16.42	\$ 22.60	\$ 20.06
Cost Per Hunt Visit	\$ 14.92	\$ 9.15	N/A	\$ 7.36	\$ 9.40	\$ 11.62	\$ 11.52
Cost Per Reservation	N/A	N/A	N/A	\$ 11.52	\$ 15.03	\$ 19.39	\$ 19.46
\$ Collected	NO FEE	\$1,570.00	\$1,475.00	\$1,495.00	\$1,225.00	\$1,415.00	\$ 965.00

N/A = Not Available

White-tailed Deer Hunting:

Deer hunting is a major public use event on the refuge and in upstate New York. The 1995 archery season was shortened by 5 days because of the government shutdown in November. A total of 538 hunt visits were made by 376 archers who harvested 16 deer.

Some changes were instituted for the 1995 firearms hunt. Changes included eliminating the hunt fee and the subsequent need for daily check-ins by staff (to collect the fee), and the reduction of check station operations from the entire season to the four "busiest" days. These changes cut the cost of the firearms hunt by 65% and staff hours involved in the hunt were reduced by 75%. Despite the reduction in check station operation, the refuge was able to collect data on 50 (68%) of the 74 deer harvested.

The firearms hunt was probably the hardest hit by the November shutdown. Even though hunters only lost one day, to many that day, the sacred opening day, is the biggest hunt day of the season. When the refuge hunt opened on Tuesday, November 21, hunters shared their "colorful" opinions of the business in Washington with the check station staff.

This year there was a number of hunter complaints about other refuge hunters not following refuge regulations. The most common complaints involved hunter's not wearing adequate solid blaze orange and hunters carrying handguns into the field. Complaints were relayed to law enforcement, who handled the situation.

When the firearms season concluded, a total of 394 hunters made 807 hunt visits and 58 deer were harvested. Tables H-10 & H-11 provide summaries of the deer hunts.

TABLE H-10

EIGHT-YEAR COMPARISON OF THE REFUGE ARCHERY DEER HUNT PROGRAM

	1988	1989	1990	1991	1992	1993	1994	1995
Number Of Days	37	39	19	18	16	22	21	15
Number Of Hunters	1,380	970	N/A	654	563	480	427	376
# Of Hunt Visits	2,300	1,618	1,188	1,198	963	852	815	538
# Of Deer Harvested	73	40	38	32	24	28	15	16
Success Rate/Hunter	5.3%	4.1%	N/A	4.9%	4.3%	5.8%	3.5%	4.3%
Success Rate/Hunt Visit	3.2%	2.5%	3.2%	2.7%	2.5%	3.3%	1.8%	3.0%
\bar{X} # Hunters/Day	62	46	63	67	60	39	39	36
Cost Of Hunt	N/A	\$3,453.00	\$5,382.00	N/A	\$1,759.00	\$2,573.37	\$2,476.30	\$1,678.37
Cost/Hunter	N/A	\$ 3.56	N/A	N/A	\$ 3.12	\$ 5.36	\$ 5.79	\$ 4.46
Cost/Hunt Visit	N/A	\$ 2.13	\$ 4.53	N/A	\$ 1.83	\$ 3.02	\$ 3.03	\$ 3.12
\$ Collected	No Fee	No Fee	No Fee	No Fee	No Fee	No Fee	No Fee	No Fee

N/A = Not Available

TABLE H-11

EIGHT-YEAR SUMMARY OF REFUGE FIREARMS DEER HUNT

	1988	1989	1990	1991	1992	1993	1994	1995
Number Of Days	6	14	11	12	12	15	15	14
Number Of Hunters	349	550	N/A	284	289	261	233	394
# Of Hunt Visits	562	916	352	674	753	761	663	807
# Of Deer Harvested	61	111	45	91	100	93	56	58
Success Rate/Hunter	17.5%	20.2%	N/A	32.0%	34.6%	35.6%	24.0%	14.7%
Success Rate/Hunt Visit	10.9%	12.1%	12.8%	13.5%	13.3%	12.2%	8.4%	7.2%
\bar{X} # Hunters/Day	94	65	32	56	63	51	44	58
Cost Of Hunt	N/A	\$4,524.00	\$5,194.78	N/A	\$4,760.10	\$5,784.58	\$4,889.45	\$3,807.03
Cost/Hunter	N/A	\$ 8.22	N/A	N/A	\$ 16.47	\$ 22.16	\$ 20.98	\$ 9.66
Cost/Hunt Visit	N/A	\$ 4.93	\$ 14.75	N/A	\$ 6.32	\$ 7.60	\$ 7.37	\$ 4.72
\$ Collected	No Fee	No Fee	\$3,420.00	\$2,790.00	\$2,785.00	\$2,515.00	\$2,260.00	No Fee

N/A = Not Available

9. Fishing

Although no refuge waters are open to fishing, the refuge maintains two fishing access sites (Armitage Road and May's Point) along the Clyde River. The May's Point fishing access sites continues to concern staff. As addressed in the Annual Fishing Program, the undercut bank, underwater tree roots, and steep, muddy bank where people fish creates a safety nightmare. The cost or repairs are more than the refuge (or the Region) could ever afford. It seems inevitable that the site will have to be closed down in the future, hopefully before someone is hurt.

In conjunction with New York State Department of Environmental Conservation, the refuge maintains a third fishing access site with a boat ramp into the Seneca River. This site is located on State land adjacent to the refuge.

An estimated 4,100 fishing visits were made to the refuge's fishing access sites during 1995.

10. Trapping

For the 1994-95 season, three area trappers successfully bid on and were awarded all six of the refuge's trapping units. A total of \$347.02 was collected from sealed bids on the six units. Trapping dates for all units were October 29, 1994 through February 12, 1995 (terrestrial sets for raccoon, fox striped skunk, weasel, and Virginia opossum) and November 26, 1994 through February 12, 1995 (muskrat and mink). Final results of the three permittees' trapping efforts were as follows:

1994-1995 Trapping Season

<u>Unit</u>	<u>Permittee</u>	<u>Bid</u>	<u>Muskrat</u>	<u>Raccoon</u>	<u>Red/Gray Fox</u>	<u>Mink</u>
A&B	E. Lawson	\$120.00	251	2	0	5
C&F	S. Schoonover	\$127.02	110	1	1	3
D&E	M. Kemak	\$100.00	262	3	1	4
Totals		\$347.02	623	6	2	12

Other species taken: Virginia opossum - 16
weasel - 2

For the 1995-96 season, four area trappers successfully bid on and were awarded four of the refuge's six trapping units. No bids were received on the two units encompassing Tschache Pool.

A total of \$839.00 was collected from sealed bids on the four units. Trapping began on all refuge units on October 28, 1995 and will continue through February 18, 1996. Final results of the four permittees' trapping efforts will be reported in the 1996 Annual Narrative Report.

11. Wildlife Observation

Wildlife observation is the primary reason people visit the refuge. Approximately 80% (105,850 people) of the refuge visitors used facilities or participated in programs provided for wildlife observation. The refuge scheduled and issued news releases for 26 guided bird tours. Additional news releases were issued to keep the public updated on events at the refuge (spring migration, bald eagles hatch, broods, shorebird migrations, Duck Stamp sales, etc...).

The 200-acre May's Point Pool provides some of the best shorebird viewing in central New York and consequently is very popular with bird watchers. Access has been along the dike for 1/4 of a mile. Unfortunately, the area of access occurs where birds are forced into a narrow strip with just a 10-foot grass buffer between birds and birders. Use of the dike by birders invariably caused birds to flush and seek other more secure areas.

Refuge staff constructed a viewing platform that reduced the amount of public access on the dike to 40 feet. The platform is located in an area previously closed to visitors and provides greater viewing of the entire pool. The viewing area consists of a widened portion of the dike which was levelled and supported by a stone retaining wall. To limit access, a split rail fence surrounds the area. Access is provided from May's Point Road by sidewalk paving blocks and semi-circular stairs.



Location on May's Point Pool Dike before
Observation Platform was constructed. (95-20; MKS)



The Observation Platform under construction.
(95-21; MKS)



The new Observation Platform on May's Point Pool Dike. (95-22; MKS)

An existing parking lot just north of the walkway was enlarged and rehabbed. To permit viewing by mobility limited visitors, a turn-around was created on the dike prior to the platform that allows for viewing from one's vehicle.

Refuge staff and volunteers heard mixed reviews from refuge visitors about the new May's Point Pool Observation Platform. Some enjoyed the better location and shorter walking distance to the observation area. Others were very displeased with the loss of dike walking access. The unhappy visitors felt the refuge has become too restrictive to non-hunting visitors, and that walking dikes and bird watching cause no disturbance to the wildlife using the refuge. Refuge Manager Hocutt, Deputy Manager Lamoy, ORP Smith, and Visitor Center Volunteers spent much of the fall migration season explaining refuge policies and the reasons behind them to visitors questioning the regulations.

It did not take long before the refuge was the subject of several internet communications. Claims that the refuge was anti-birder quieted after several prominent birders (and refuge supporters) logged on and defended the refuge and attempted to remind people of the refuge's purpose.

Refuge Manager Hocutt developed a presentation which dealt with the mission of the FWS and the NWRs, and also went into some depth on compatibility and visitor responsibilities. He used an existing October public speaking schedule to address the issues head-on. It was our good fortune that the controversy began in and was fed by three metro-Rochester bird clubs. Hocutt addressed all three groups during the fall:

October 11: Genesee Ornithological Society -
35 persons.

October 12: Rochester Birding Association -
40 persons.

October 25: Genesee West Audubon Society -
30 persons.

17. Law Enforcement

Assistant Manager Lamoy attended the Remington Arms Armorer's School in March for training prior to becoming the Regional Shotgun Armorer.

Assistant Manager Lamoy attended the annual Law Enforcement in-service training at Patuxent NWR as a student, instructor, and armorer from April 2 to 12.

In general, there were few violations associated with general refuge visitation in 1995. Most people have accepted our fall, 1993 closure of the Wildlife Drive to walking and bicycling. The few cases which were noted were handled verbally. To accommodate shorebird watchers at May's Point Pool, an observation platform (Section H-11) was constructed. The platform allows viewing of most of the entire pool, and results in a 40-foot disturbance zone compared to the previous disruption area of 1/4 mile. This restriction, a use modification necessitated by the Compatibility Review, although not at all popular with many birders, was accepted and compliance was quite good.

Several hunters were issued NOV's for violations during the deer hunts. Two archers were cited for failure to check-out on time. During the shotgun hunt, refuge staff began to receive numerous reports and complaints about hunters wearing inadequate hunter orange material. Lamoy cited a total of seven individuals (plus a juvenile who received only a letter) for inadequate hunter orange. Many more hunters were also contacted along roads or in parking areas, and cautioned to wear adequate orange.

I. EQUIPMENT AND FACILITIES

1. New Construction

No "major" projects were funded in FY 1995. Therefore, most work involved rehab or maintenance of existing facilities or structures.

The one exception is a viewing area, constructed Force Account for a total cost of about \$2,000.00. This project (see Section H-11) was undertaken to permit compatible public viewing of shorebirds and waterfowl at May's Point Pool. Work involved widening the dike somewhat. A stonework retaining wall was placed to hold the back side of the platform. Stonework steps and sidewalk pavers were placed to permit access from May's Point Road. A split rail "corral" was constructed to contain visitors' activities. Handicapped access could not be built in on our limited budget; therefore, an existing turn-around on the dike (very close to the project site) was improved to permit handicapped individuals to drive down the dike (upon request), turn their vehicle, and observe from the vehicle.

The newly-acquired Waugh Tract was posted. Since the refuge owns the "road" (trail) in that area, the vehicle gate was relocated to prohibit trespass. A small parking lot, primarily for hunter access, was constructed just outside the gate using 24 yards of gravel donated by the Town of Tyre Highway Department. This lot will need additional work in the future, but got us through the 1995 hunt season.

2. Rehabilitation

As indicated in the previous section, lots of rehab was completed in FY 1995.

Our showcase project for FY 1995 involved rehab of an old low dike, just north of May's Point Dike. This project was undertaken to provide additional shorebird habitat (see Section F-2). Approximately 2,300 feet of the old dike was re-cored and raised to about three feet using on-site material. The dike top was formed to a width of ten feet with 3:1 slopes. In September, the interior was disced to keep down the old growth of purple loosestrife, box elder, and reed canary grass. The dike was disced, fertilized and limed, seeded, and mulched. Two water control structures were set to provide for flooding (from May's Point Pool) and dewatering (into the Canal). Until a better name is discovered, this pool will be known as Box Elder Bog to recognize the former dominant cover.



Maintenance Mechanic Flanders restoring the old dike. The pool interior will be managed as a moist soil impoundment primarily for shorebirds. (95-23; TAG)

Another major rehab project included completely excavating a two to three-foot thick layer of silt from the Display Pool. This small pool was one of the first built on the refuge, and is a visitor's first impression of the refuge. As described last year, the thick layer of sediment was caused by improper maintenance of the old outlet structure, which prevented full drainage of the pool by effectively raising the bottom of the structure by at least two feet. During excavation, two nesting islands were removed. Only geese were likely to use these islands, and it is currently not advisable to encourage "resident" geese. Excavated material was blended in to the existing terrain. Side slopes were graded to maximize shallow water areas. In early fall, all bare areas were cultivated, fertilized, limed, and seeded. The area now presents a pleasing first impression, and will be used by waterfowl.

As reported last year, the barn foundation at Sub-headquarters was severely damaged by water and/or frost, and without repair the barn was in serious peril. Rehab work started in March. Using drawings from Regional Office Engineering, the foundation wall was exposed by step elevation. A 4" drain tile was installed at the base of the footer to collect and discharge water on the low (east)

side, away from the barn. Geo-textile fabric was installed along the wall. The trench was backfilled with #2 stone to form a two foot wide drainage to the drain tile. Soil was backfilled to elevation outside the drain trench and sloped to provide maximum surface drainage away from the barn. Along with the exterior work, two basement-style windows were blocked in, and the large cracks in the walls were grouted. As of this writing, we are pleased to report that the cracks have not re-opened. This indicates that water is draining away and our repairs will likely hold; thus, the barn will be serviceable for several more years.



Years of poor drainage around the barn resulted in the foundation shifting badly. (95-24; MJN)



Flanders and Dates improving drainage around the barn. Also note Norsen has blocked up window.
(95-25; REL)

While the equipment was on-site, the Subheadquarters parking lot was enlarged and the entrance road was modified. These minor changes were made to permit all hunter check-ins at the Check Station.

It is with mixed feelings that we report replacement of the old entrance sign. The old stone base, which was no doubt a very scenic traffic hazard, was removed. The area was graded to permit easier maintenance. The new sign was set in a framework of cedar 6x6's. The breakaway construction makes it much safer. It looks very professional and quite good, but...



The old refuge entrance sign was removed and replaced with a new frame and sign. (95-26; REL)



The new entrance sign meets the Service's sign requirement. (95-27; REL)

In 1995 the refuge was budgeted \$10,000.00 to pave a small parking area in front of the Visitor Center for handicapped accessibility. While this is certainly necessary and desirable, it just would not work! Central New York is annually blessed (or cursed) with about six feet of snow. Usually this must be removed with a plow to make any parking accessible. The placement of a small paved pad in the middle of an acre of gravel would severely hinder snow removal. After discussions with Engineering, it was decided to hard-surface the necessary slots with stone dust until money becomes available to pave the entire parking area. This freed up the majority of the \$10,000.00 for use on other accessibility projects. Part of these funds were used in the May's Point Observation Platform (see Section I-1). Another \$2,850.00 was used to contract James Spano, Inc., a local paving contractor, to repair, widen, and upgrade the sidewalk to the public restrooms. The sidewalk now meets accessibility standards. It was also extended slightly to provide access to the nearby picnic tables.

Maintenance Mechanic Norsen used a few hundred dollars from this source to convert the old Unit 17 Pumphouse foundation to a handicapped-accessible hunting platform. The platform, originally started in FY 1994, was provided with rails and a ramp. This project is now nearly complete. We are only waiting for the earthen portion of the ramp to settle before final hard-surfacing.

A new overhead door was installed in the storage building at a cost of \$972.00.

3. Major Maintenance

The Fur House roof was replaced by B & M Roofing for \$1,850.00. Completion of this roof means that all refuge roofs have been replaced recently and are in good shape.

Maintenance Mechanic Norsen completely repainted the exterior of the Office in the summer. An opaque stain was used. Mel also got a good start on repainting the shop building.

An unplanned major maintenance project was necessitated when the non-potable water storage suddenly developed an extremely foul odor in mid-June. The exact cause is unknown, but we suspect decomposing matter in the storage building gutters, which partially supply the water. The tank was pumped and cleaned by Environmental Products and Services for \$1,600.00.

Along with scheduled preventative maintenance the following repairs were completed by refuge staff:

- Black Utility Trailer: sanded, primed, and painted.
- Dump Truck: installed heavy duty pintel hook, 40,000-lb. horizontal and 9,800-lb. vertical load rating.
- Installed Service-standard trailer electrical connectors on all trailers and tow vehicles.
- Fire Pumper: installed new foot valve and suction line.
- Ford 908 Mower Deck: rebuilt rear deflector shield, rebuilt slip clutch, and installed new PTO shaft.
- 1984 K-Car: replaced rear shocks, fuel tank and sending unit, carburetor AIR valve, and front motor mount.
- Roller: rebuilt carburetor, adjusted governor.
- John Deere 570A Grader: replaced foam liner in roof.
- Air Boat: surface grind exhaust manifolds (Seneca Falls Technology), replaced valve cover gaskets, oil return lines, spark plugs, and floor boards, and installed vinyl mat on floor boards.
- John Deere 1418 Mower Deck: the center gear box was rebuilt to replace broken gears.
- Ford 531 Tractor: replaced battery.
- Chevy Suburban: replaced battery.
- 1987 Dodge Dakota: replaced rear brake cylinders and shoes, and master cylinder.
- 1992 Dodge Dakota: replaced both front tires and did a front-end alignment.
- 1982 Dodge Ram: replaced front brake caliper and pads.
- 1985 Jeep: replaced battery.
- 1991 Dodge W150: replaced distributor pick-up.
- John Deere 550A Dozer: repaired broken track link and pad.

4. Equipment Utilization And Replacement

Only one "major" new piece of outdoor equipment was received in 1995. A Honda 4-Wheeler, Model TRX300FW, was purchased for \$5,080.00. This vehicle will be useful for posting and FmHA visits, as well as a multitude of other tasks. A 10-gallon sprayer was also purchased to permit herbicide treatment with the 4-wheeler.

At the end of FY 1995, a compact 4x2 van-wagon was ordered for \$17,000.00. This vehicle will be useful for small tours which are frequently provided by Refuge Manager Hocutt, and for trips.

Indoor-type equipment purchased in 1995 included a Sharp Model 2214 copier for the Visitor Center for \$2,243.00. This small copier, originally purchased to make small numbers of copies for visitors and at meetings in the VCS, is extremely versatile and receives nearly as much use as the larger copier in the Office.

Five pair of Swift Ultralite 8x42 binoculars were purchased at a cost of \$200.00 each. These binoculars provide extremely clear views and appear to be excellent quality for the price.

The John Deere 690C Excavator was on loan to Forsythe NWR from January through April. In June the excavator was temporarily traded to Iroquois for their John Deere 750 Dozer.

In April the refuge took delivery of 200 cubic yards of wood chips from nearby Seneca Army Depot. The chips were spread on Esker Brook Trails.

5. Communications Systems

The aging Motorola radio system came through FY 1995 with only "normal" repairs to maintenance. A total of \$561.00 was spent.

Two new five-watt Maxtrac 100 Motorola mobile radios were purchased for \$450.00. By juggling various units, we will now be able to mount a "permanent" radio in the JD 7600 tractor instead of carrying (or forgetting) a hand-held unit.

6. Computer Systems

FY 1995 was a year of major updates for refuge computers. Several new computers and accompanying software were purchased.

The old 286 used by Clerk-Typist Estes was replaced by a 486 DX/2 for a cost of \$2,499.00. The new computer gives Nancy much more speed, more storage, and is capable of many more tasks.

The 386 used by ORP Smith suffered a crashed hard-drive in late summer and was replaced by an EPS Technologies Pentium 100 Mhz with 32 MB RAM for a cost of \$3,828.00. This machine is capable of doing sophisticated graphics, and these capabilities were supported by purchase of a Kroy Image Crafter System for \$2,195.00. This combination of units will allow more professional-looking exhibits and displays.

Biologist Gingrich received an EPS Technologies Notebook Computer for a cost of \$3,953.00. This unit has a Pentium processor operating at 90 Mhz with 8 MB RAM. The laptop will be used for keeping field notes, and will be especially useful for FmHA visits.

Software was installed/updated to allow Administrative Assistant McMahon to communicate with the Denver Service Center and to update CC:Mail capabilities.

7. Energy Conservation

Bottom-line numbers for energy indicate decreases in use for electricity, propane, gasoline, and diesel fuel compared to 1994.

Total station electric use was only about 1,000 kilowatts less than 1994. The difference would have been greater except that the residence was not used in 1994, but used by three student interns in 1995.

Total propane use was only 4,714 gallons in 1995, compared to 5,920 gallons in 1994. This huge difference reflects the extremely mild winter of 1995 compared to the record cold of 1994. This was the lowest use of propane since 1991.

Gasoline use was the lowest since 1989, with 3,487 gallons used. There are many reasons for the decline. Montezuma did not have YCC in 1995, which probably accounted for most of the difference. The Service did not participate in the New York State Fair; hence, many trips to Syracuse were eliminated. There were also three weeks of Government furloughs in 1995, with little vehicular use.

Diesel fuel use in 1995 was 1,569 gallons, compared to 2,183 gallons in 1994. This is indicative of less equipment use in 1995. High diesel fuel use in 1993 and 1994 was necessitated by the flood of 1993, which caused severe dike damage and necessitated some rather extensive repairs.

J. OTHER ITEMS

3. Items of Interest

On the night of January 29, Mr. and Mrs. Hocutt attended the annual Awards Dinner at the Holiday Inn in Waterloo, New York of the Seneca County Chamber of Commerce. The refuge was the recipient of a 1994 Progress Award for its contributions to and support of tourism in Seneca County. In brief remarks, Hocutt pledged the continued support of refuge staff and volunteers to plans by the Chamber for a greatly-increased tourism effort in the county. In view of this, Hocutt urged the county to develop an Environmental Management Council and a Cayuga Lake Association -- pointing out that Seneca County was unique among Finger Lakes counties in having neither.

On April 17, Hocutt provided an extensive tour of the refuge for Patsy Amidon, Chairman of the Board of Supervisors for the Town of Tyre, New York. We also held a lengthy discussion about the expansion program (the Foster, Waugh, and Furman acquisitions), and current revenue-sharing protocol.

On May 2nd, Hocutt accompanied Sherry Morgan (New York Field Office) and Montezuma ROPS Bob Lamoy to Syracuse on a "get acquainted" visit with John McGuire, Administrative Assistant to Congressman Jim Walsh. The meeting was very productive and allowed Sherry a chance to introduce the ES role to McGuire. We have been very fortunate to work closely with John (and the Congressman) for a number of years on a number of issues. Although unannounced, Hocutt stopped in the Federal Building to say a quick hello to Gretchen Ralph, Executive Assistant to U.S. Senator Alphonse D'Amato. Ms. Ralph graciously invited us in for a visit. Again, Ms. Ralph has been very helpful to us in the past in issues involving Senator D'Amato's sphere of interest.

On June 12, Hocutt spoke at the Savannah (Wayne County, New York) Town Board of Supervisors' meeting about the Northern Montezuma Expansion Project. Despite some early skepticism, the meeting went very well. They supervisors were impressed by the Revenue Sharing Program, as well as by our flexibility in management regimes which might affect neighbors. We have yet to buy land in Wayne County, but in view of the fact that most of the supervisors are farmers, the visit was very helpful.

On June 13, at the request of Director of Canals John Jermano, Hocutt accompanied Albany and Syracuse District Engineers on the tug "Syracuse" on a portion of their inspection tour of area locks and dams. The trip gave an

entire day to discuss the lake level controversy with all of the principals. Mr. Jermano will retire on July 31, 1995. He has been a staunch friend of the refuge; there would have been no Cayuga Lake Connector except for his support. We will miss him very much.

On June 20, Hocutt hosted Ms. Joan Mueller, Executive Assistant and Director of the Rochester Office of U.S. Senator Alphonse D'Amato. In addition to an airboat and vehicular tour of the refuge, Hocutt and Mueller discussed F.L.E.A., the lake level issue, acquisition, and the imminent Seneca Meadows Landfill expansion proposal. Ms. Mueller has been very helpful in past issues. Her grandson Kyle accompanied us.

On July 18, Hocutt provided a management tour by vehicle and airboat for Bob Michalovic, former New York State Chairman of Ducks Unlimited, and Ed Fiorino, former President of Lake Plains Waterfowl Club. Both men are major players in New York State waterfowl circles.

On October 11, we were visited by Renee Davison, the new Regional Director for Region 8 (Avon) of the New York State Department of Environmental Conservation. Ms. Davison was accompanied by Ned Holmes, NYSDEC Region 8 Fish and Wildlife Administrator. Sufficient time was available for Hocutt to introduce her to the refuge staff, and to climb the Main Pool Observation Tower and discuss a number of issues ranging from the Northern Montezuma Project to the Seneca Meadows Landfill.

On October 18, Hocutt hosted Ms. Susanne Dwyer, newly-appointed District Field Representative for Congressman James Walsh. An extensive tour of the refuge occurred, where Ms. Dwyer had an opportunity to see the tens of thousands of ducks and geese using the refuge. We discussed issues involving the Congressman's office and the refuge that she needs to learn. We agreed upon a protocol in which she would contact me first with any congressional inquiries, and I would, in turn, remain in contact and provide in-depth background information to her as needed. The visit built important bridges.

On October 20, Hocutt hosted 24 members of the Monroe County (Rochester) Environmental Management Council. The group participated in a three-hour field trip led by Hocutt. Unfortunately, there was a driving rain throughout the field trip; however, no one was dissuaded from viewing the magnificent collection of waterfowl.

On October 24, Hocutt hosted the Cayuga County Environmental Management Council at the refuge Visitor Center. Hocutt conducted a one-hour tour for ten members. Much of the

discussion had to do with the lake level issue and efforts by the Seneca River - Cross Lakes Association (CLSRA) to bring political pressure upon the Canal Corporation to lower the lakes one to four feet below their 60-year old average. Hocutt was successful in limiting the scope of the work by the lake level sub-committee to ensure that it stayed away from non-scientific notions and beliefs about flooding along the Seneca River. CLSRA President Bill Jaynes attended the meeting, and participated. Several differences in opinion were expressed during the meeting between Jaynes and Hocutt about the lake level issue.

The controversy with local birders about access to May's Point Pool and exiting from vehicles at Benning Marsh calmed somewhat. The New York State Bird Internet also quieted after several prominent area birders came out on the internet in support of refuge efforts. Hocutt developed a presentation which dealt with the mission of the FWS and the NWRS, and also went into some depth on compatibility and visitor responsibilities. He used an existing October public speaking schedule to address the issues head-on. It was our good fortune that the controversy began in and was fed by three metro-Rochester bird clubs. Hocutt journeyed to Rochester and addressed all three groups during October:

- October 11: Genesee Ornithological Society - 35 persons.
- October 12: Rochester Birding Association - 40 persons.
- October 25: Genesee West Audubon Society - 30 persons.

On November 28, Hocutt delivered a two-hour lecture to 60 undergraduate and graduate students in Dr. Guy Baldassarre's Wetlands Class at the State University of New York College of Environmental Science and Forestry at Syracuse. The lecture was about communications, networking, and conflict resolution in natural resource management. 1995 represents the fifth consecutive year that Hocutt has spoken there.

Training in 1995 included:

- Dates - Visa Card Training, Seneca Falls, NY, 6/1/95 (4 hours).
- Estes - 6-Hour Defensive Driver Training, Seneca Falls, NY, 2/14/95 (6 hours).

Flanders - 6-Hour Defensive Driver Training, Seneca Falls, NY, 2/14/95 (6 hours).

Visa Card Training, Seneca Falls, NY, 6/1/95 (4 hours).

Gingrich - 6-Hour Defensive Driver Training, Seneca Falls, NY, 2/14/95 (6 hours).

Visa Card Training, Seneca Falls, NY, 6/1/95 (4 hours).

RICRA Training, Laurel, MD, 7/11/95 - 7/12/95 (16 hours).

Introduction to Desktop GIS For Field Biologists, Hadley, MA, 7/18/95 - 7/19/95 (16 hours).

Fire Management Planning Workshop, Hadley, MA, 7/25/95 - 7/27/95 (24 hours).

Hocutt - 6-Hour Defensive Driver Training, Seneca Falls, NY, 2/14/95 (6 hours).

Visa Card Training, Seneca Falls, NY, 6/1/95 (4 hours).

Lamoy - 6-Hour Defensive Driver Training, Seneca Falls, NY, 2/14/95 (6 hours).

Police Armorer's Seminar, Ilion, NY, 3/7/95 - 3/10/95 (32 hours).

Ruger Mini-14 Rifle Familiarization Training - Firearms Instructor Training, Laurel, MD, 4/8/95 (8 hours).

1995 Law Enforcement In-Service Training, Laurel, MD, 4/10/95 - 4/14/95 (40 hours).

Visa Card Training, Seneca Falls, NY, 6/1/95 (4 hours).

McMahon - 6-Hour Defensive Driver Training, Seneca Falls, NY, 2/14/95 (6 hours).

Visa Card Training, Seneca Falls, NY,
6/1/95 (4 hours).

Pre-Retirement Seminar, Seneca Falls,
NY, 6/6/95 - 6/7/95 (16 hours).

Norsen - 6-Hour Defensive Driver Training, Seneca
Falls, NY, 2/14/95 (6 hours).

Visa Card Training, Seneca Falls, NY,
6/1/95 (4 hours).

Pre-Retirement Seminar, Seneca Falls,
NY, 6/6/95 - 6/7/95 (16 hours).

Smith - 6-Hour Defensive Driver Training, Seneca
Falls, NY, 2/14/95 (6 hours).

Visa Card Training, Seneca Falls, NY,
6/1/95 (4 hours).

Special Assignments/Details:

Flanders served as an Instructor for Heavy Equipment Training, Forsythe NWR, January 9-12, 1995; and Cape Charles, Virginia, May 4-12, 1995.

Flanders attended a coordination/planning meeting for heavy equipment operation held in the Hadley, Massachusetts, Regional Office, March 23, 1995.

Flanders provided ATV Safety Training for all Montezuma Refuge personnel on July 21, 1995.

Gingrich attended a Moist Soil Meeting held in Sussex, New Jersey, May 17-19, 1995.

Gingrich made several inspection visits to several different areas for FmHA easements: between Baldwinsville, New York and Watertown, New York (June 7-8, 1995); up to Massena, New York (July 5-6, 1995); between Seneca Falls, New York and Canastota, New York (September 14-15, 1995); between Seneca Falls, New York and Cortland, New York (September 20-21, 1995); and Queensbury, New York (September 27-29, 1995).

Hocutt attended the "Refuge Criteria Development Team Meeting" held at Great Swamp NWR, April 20-21, 1995.

Hocutt attended a reorganization meeting held in the Hadley, Massachusetts, Regional Office, May 24-25, 1995.

Lamoy served as a firearms instructor and armorer at the 1995 Law Enforcement In-Service Training in Laurel, Maryland, April 3-7, 1995.

Lamoy provided semi-annual firearms qualification for Refuge Officer Gerhart (IRQ) and Special Agents Gale and Garabedian on August 28.

Lamoy attended an Ecosystem Team Meeting, Detroit, Michigan, July 12-13, 1995.

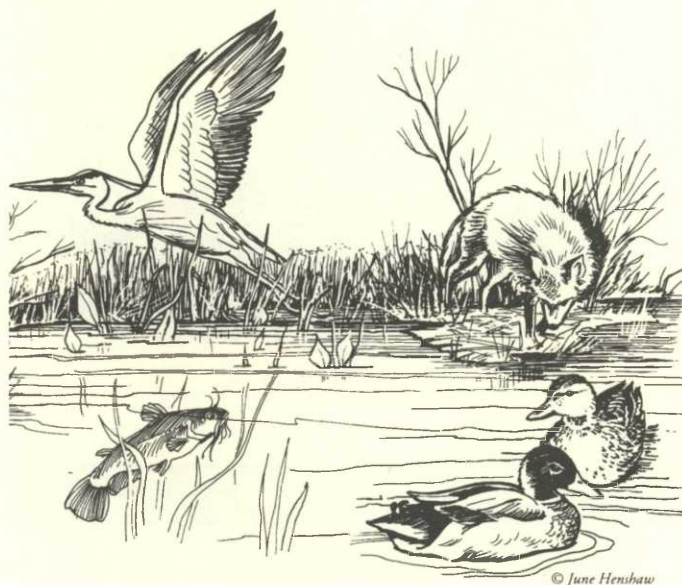
4. Credits

Typing and Proofreading - Estes
Climatic Conditions - Lamoy, Norsen
Planning - Hocutt, Gingrich
Administration - Hocutt, McMahon, Lamoy
Habitat Management - Gingrich
Wildlife - Gingrich
Public Use - Smith, Lamoy
Equipment and Facilities - Lamoy, Flanders, Norsen
Other Items - Hocutt, McMahon, Gingrich
Editing - Hocutt, Estes
Feedback - Hocutt

Photograph Credits

KC - Kevin Colton, Refuge Volunteer
AD - Alison Donofrio, Refuge Intern
AF - Ann Foland, Refuge Volunteer
MM - Margaret McKinney, Refuge Volunteer
TAG - Tracy Gingrich, Refuge Biologist
REL - Robert Lamoy, Assistant Refuge Manager
MJN - Melvin Norsen, Refuge Maintenance Mechanic
MKS - Marva Smith, Refuge Outdoor Recreation Planner

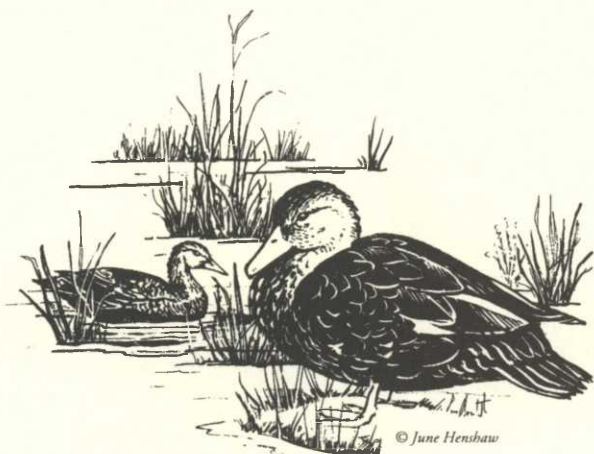
Montezuma



MONTEZUMA
National Wildlife Refuge
Seneca Falls, New York

Welcome to Montezuma

Montezuma National Wildlife Refuge lies at the north end of Cayuga Lake, in the heart of the Finger Lakes Region of New York State. Located 5 miles (8 kilometers) east of Seneca Falls, in Seneca County, Montezuma Refuge serves as a major resting area for waterfowl and other waterbirds on their journeys to and from nesting areas in northeastern and east-central Canada. Refuge management benefits wildlife and provides a place for people to visit and enjoy wildlife in its natural habitat.



Once Extensive Marshes

The Finger Lakes Region was shaped during the last glacial period, some 10,000 years ago. The retreating glacier created a vast system of lakes. In time, the shallower northern and southern ends of the lakes developed into extensive marshes.

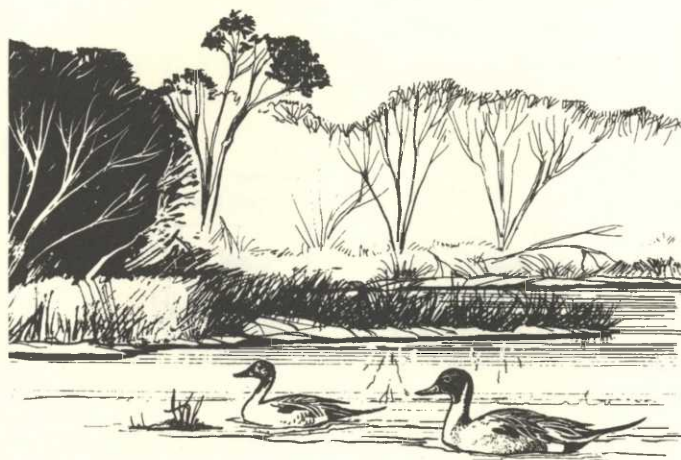
The earliest known inhabitants of this region were Algonquin Indians. They were succeeded by the Cayugas of the Iroquois Nation. These early Americans derived part of their livelihood from the wildlife and plants of the area's bountiful marshes.

Prior to the turn of the century, the Montezuma Marsh extended north from Cayuga Lake for 12 miles (19 kilometers) and was up to 8 miles (13 kilometers) wide. The marsh

was one of the most productive in North America. As with most wetlands during that era, the importance of the marshes went unrecognized. Construction of the dam at the outlet of Cayuga Lake and changes made to existing rivers during the building of the New York State Barge Canal contributed to the loss of the marsh. By the early 1900s all but a small portion had been drained.

In 1937 the Bureau of Biological Survey, which later became the U.S. Fish and Wildlife Service, purchased 6,432 acres (2,603 hectares) of the former marsh. This land would become the Montezuma National Wildlife Refuge. The Civilian Conservation Corps began work on a series of low dikes which would hold water and restore part of the marsh.

Efforts to restore and preserve the marsh continue today with the Northern Montezuma Wetlands Project. This project involves the Service, New York State Department of Environmental Conservation, conservation organizations, corporations, and private landowners, all working together to restore and enhance wetland habitats and the populations of wetland-dependant wildlife on 36,050 acres (14,590 hectares) of the former Montezuma Marsh. The Northern Montezuma Wetlands Project is part of the North American Waterfowl Management Plan, an international agreement between the United States, Canada, and Mexico that seeks to restore, conserve, and enhance wetland habitats and waterfowl populations throughout North America.



Why a Refuge?

Montezuma National Wildlife Refuge was established in 1938 as a refuge and breeding ground for migratory birds and other wildlife. The refuge provides resting, feeding, and nesting habitat for waterfowl and other migratory birds. Montezuma is situated in the middle of one of the most active flight lanes in the Atlantic Flyway.

Careful management of the refuge's 3,500 acres (1,417 hectares) of diked pools ensures that migrating birds will find suitable food in a mix of emergent and submergent plants along with open water and mudflats. Water levels are carefully manipulated throughout the year to provide habitat and food for many bird species.

Wooded areas, grasslands, and wetland habitat are also managed to provide a healthy, self-sustaining population of many wildlife species including mammals, resident birds, reptiles, amphibians, and insects which are normally found in Central New York.

In 1976, the refuge cooperated with the New York State Department of Environmental Conservation on a bald eagle release program at Montezuma. Over a period of four years, 23 eagles were released through a hacking program. Since the program's inception, bald eagles have returned to Montezuma and have successfully reared young.

The refuge has been a study site for learning about the impacts of the pest plant purple loosestrife on marsh ecosystems and establishing techniques to control its spread. The refuge has worked with Cornell University on these studies.

The refuge also provides compatible wildlife-oriented educational and recreational opportunities for the thousands of visitors who visit each year. Recreational opportunities are carefully planned to complement the management of the refuge.



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Wildlife Calendar

Fall Migration:

WATERFOWL—Mid-September to freeze-up; Canada goose numbers peak (50,000) in mid-November; duck numbers peak (150,000) late November. Best viewing times are early morning and late afternoon.

SHOREBIRDS/WADING BIRDS—Mid-August through mid-October; peak mid-September. Killdeer, yellowlegs, and other shorebirds can be seen on exposed mudflats, while herons and egrets use the shallow water areas throughout the day. Shorebird watching is best at Mays Point Pool and Benning Marsh where water levels are managed seasonally for their benefit.

Winter:

The self-guided Wildlife Drive is generally closed to traffic (depending upon snow/ice/road conditions). Cross-country skiing and snowshoeing on the Wildlife Drive provide an excellent opportunity to see white-tailed deer, small mammals, and resident birds such as blue jays, woodpeckers, nuthatches, and black-capped chickadees.

Spring Migration:

WATERFOWL—Late February through April—varies as to weather and thaw—85,000 Canada geese, 12,000 snow geese (both color phases are present). Many species of ducks are present though not as numerous as in the fall. Best viewing times are in early morning and late afternoon.

SHOREBIRDS—Shorebird migration is less spectacular than in the fall, but birds are common early-May to mid-June.



© June Henshaw

WARBLERS—The peak of warbler migration is mid-May. Best viewing is on Esker Brook Trail from dawn until mid-morning.

WILDFLOWERS—From April through June; peak is in May. Violets, trilliums, mayapples, vetches, mustards and others can be seen along Esker Brook Trail.

Summer:

WATERFOWL NESTING—Canada geese and several duck species nest on the refuge beginning in early March. Broods first appear in early May and can be seen throughout the summer.

HERON ROOKERY—Great blue herons nest in the wooded area adjacent to the Main Pool. Black-crowned night herons may also be seen in Main Pool.

FLOWERING PLANTS—Throughout the summer flowering plants may be seen from the Wildlife Drive. Purple loosestrife, iris, mallow, and white water lily peak in late July.



© June Henshaw

Year-round:

White-tailed deer, muskrats, foxes, and other resident wildlife can be seen throughout the year. Best viewing times are early morning and late afternoon. You may wish to plan your trip accordingly.

With advance notice, educational programs are available to organized groups throughout the year. The refuge provides area teachers and students with three outdoor classroom sites for environmental education. Teacher workshops are held at various times during the year which enable teachers to effectively utilize the refuge as a resource for scheduled field trips.

The refuge provides an extensive assortment of wildlife videos (free of charge) to area educators. Videos are also available for viewing in the Visitor Center.

Enjoying the Refuge

Recreational and educational activities abound at Montezuma throughout the year. The refuge is open daily during daylight hours. Since Montezuma is a national wildlife refuge, **collecting, disturbing, injuring or damaging plants or animals is prohibited.**



The Visitor Center contains exhibits, brochures and restrooms. Hours of operation vary by season; call the refuge for information on the Center's schedule. The observation deck and tower provide excellent opportunities to see wildlife.



The self-guided Wildlife Drive provides opportunities to observe and photograph wildlife from your car. Please **stay in your vehicle** since it serves as a blind and minimizes disturbance to wildlife. Snow, ice and poor road conditions generally keep the road closed during the winter and early spring months.

There are **no** bicycling facilities at Montezuma.



Esker Brook Trail, a 2 mile (3.2 kilometer) walking trail, is open from January through October. The Wildlife Drive is open for cross-country skiing and snowshoeing during the winter. All hiking and skiing is limited to established trails.

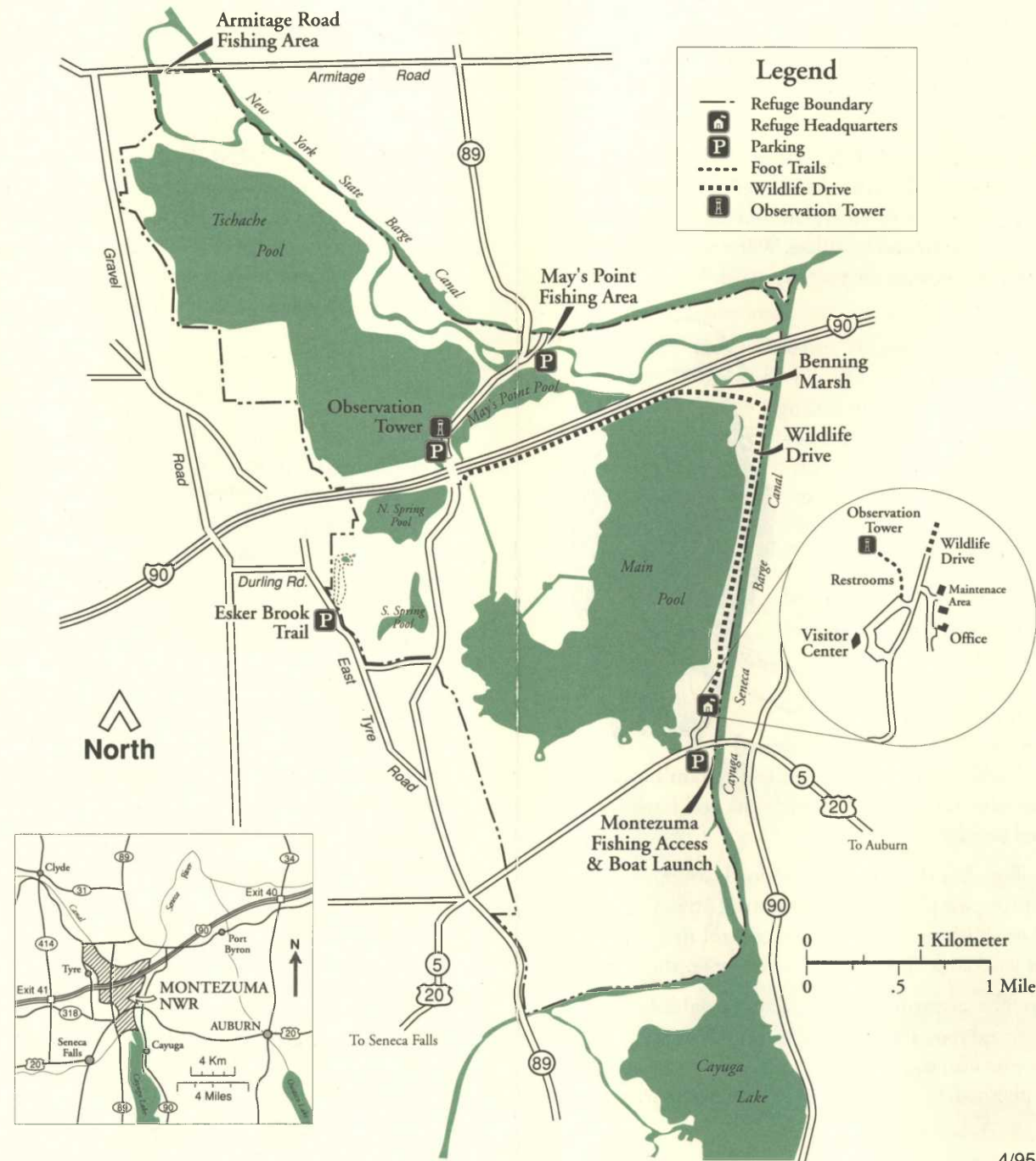


Although fishing and boating are prohibited in refuge waters, the refuge maintains a boat launch providing access to the state-owned Barge Canal. Three public fishing sites provide bank fishing access to the canal.



Public hunting, for waterfowl and deer, is permitted under special regulations on portions of the refuge during the state seasons. Contact refuge manager for additional information.

Montezuma National Wildlife Refuge



U.S. Fish and Wildlife Service

Montezuma is one of over 500 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages national fish hatcheries, and provides federal leadership in habitat protection, technical assistance, and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

For further information, please contact:

Refuge Manager
Montezuma National Wildlife Refuge
3395 Route 5 & 20 East
Seneca Falls, New York 13148
Telephone: (315) 568-5987

Hard of hearing or deaf visitors may call the Massachusetts Relay Center at 1-800-439-2370

This brochure is also available upon request in a large print version.



DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

May 1995

Hope for the Future

The future for the bald eagle in New York and at Montezuma looks very bright. Levels of environmental contaminants such as DDT, which have drastically affected bald eagles, are declining. Montezuma's place in the future of the bald eagle's return is very secure. And, in view of the contributions that the Montezuma birds have made to eagle successes in other areas of the state, it seems somehow very appropriate that some of the birds have finally come home to roost.

All recent eagle activity at Montezuma has occurred at or around Tschache Pool. Visitors are most likely to observe the birds from the observation tower (binoculars or a spotting scope are generally required). Tschache Pool dike (road) is open for 150 yards at the south end of the pool. The rest of the area is closed for the eagles' best interest and protection. Eagles will not tolerate human disturbance in their nesting territory, for humans are considered a threat to themselves and their young.



BALD EAGLE FACTS

- ♦ Scientific name: *Haliaeetus leucocephalus*
- ♦ Our Nation's symbol
- ♦ Only species of eagle unique to the North American continent
- ♦ One of the largest birds of prey in North America. Males: 3 feet from head to tail; weight 8 to 10 lbs; wingspan about 6 ½ feet. Females: slightly larger than males – 3 ½ feet from head to tail; weight 10 to 14 lbs; wingspan up to 8 feet.
- ♦ Live for 25-35 years in the wild
- ♦ Usually mate for life (if one dies, the other will seek a new mate)
- ♦ White head and tail feathers are characteristic of adults.
- ♦ Mature at 4-5 years of age (reproductive maturity).
- ♦ Immature eagles lack the white head and tail. Mostly chocolate brown with varying amounts of white on body, tail, and underwings.
- ♦ Nests: large stick structures, usually high in large trees near water. Nests are reused and added to each year. The nests are 5-6 feet wide by 3-4 feet tall. Eagles nest once a year. 1-3 eggs are laid, with 35 days of incubation. Birds fledge (leave the nest for the first time) at 10 to 12 weeks.
- ♦ Food: fish, carrion (dead animals), mammals, snakes, and other birds

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DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

RL-52550

February 1994

Bald Eagles

MONTEZUMA
National Wildlife Refuge



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Seneca Falls, New York

On the Road to Disaster

Prior to the 1950's, New York State had upwards of 70 nesting pairs of bald eagles. A combination of events led to only one known active bald eagle nest in the entire state by 1960. This last nesting pair, like many of the others which had existed in the state, suffered from an accumulation of pesticides (primarily DDT) in their body tissues. This accumulation inhibited successful egg laying and consequently the production of young eagles. Other factors contributing to the decline of the birds in New York and elsewhere included the loss of necessary habitat and the illegal killing of the birds.

The drastic decline in numbers led the federal government to declare the bald eagle to be endangered in the lower 48 states, except for the states of Washington, Oregon, Minnesota, Wisconsin, and Michigan, where the bird is listed as threatened.

The Long Road Back

Due to the protection afforded by the Bald Eagle Act of 1940 and the Endangered Species Act of 1973, and the efforts made toward cleaning up the environment, the outlook for bald eagles is more promising than it has been in several decades. In the mid-1970's New York launched the most comprehensive bald eagle restoration program in the nation. This program was designed to return breeding bald eagles to all portions of the state still suitable for their existence.

In 1976, a program designed to reestablish nesting bald eagles in New York was undertaken at the Montezuma National Wildlife Refuge by the New York State Department of Environmental Conservation in cooperation with the U.S. Fish and Wildlife Service. The program involved the use of a falconry technique called "hacking" to release young bald eagles to the wild. The Montezuma program in 1976 was the first of its kind on the North American continent.



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In the hacking process, immature bald eagles were placed in artificial nests on a caged platform atop a high tower. The birds were fed carp and small mammals until they were ready to fly. The feeding was done carefully so that the young birds would not associate people with food or lose their fear of humans.

Montezuma National Wildlife Refuge was chosen as the site for the release program because of its central location, large amounts of suitable habitat, abundance of prey species, and limited disturbances. In addition, Montezuma was formerly an active bald eagle nesting site as late as 1959, with young last successfully produced in 1956.

From 1976 to 1980 a total of 23 bald eagles were released at the refuge through the hacking program. The birds were obtained from wild nests in Michigan, Minnesota, and Wisconsin, and from the captive breeding stock at the U.S. Fish and Wildlife Service Research Laboratory in Patuxent, Maryland. The project demonstrated that young bald eagles can be reared in man-made situations and still learn to hunt, feed, and survive on their own. The program attained its greatest success in the spring of 1980 when the first two eagles released in the program (1976) successfully nested in northern New York. In 1981, the hacking project was expanded and relocated to the Oak Orchard Wildlife Management Area in western New York.

Return of a Symbol at Montezuma

During early July of 1987 a local farmer reported seeing a large nest in an isolated location on the Montezuma National Wildlife Refuge. Field inspection of the site disclosed not only the nest but the presence of two nearly grown eaglets. The young eagles were approximately 11 weeks old and only days away from being ready to fledge (leave the nest for the first time). The two young birds were the first to be produced at Montezuma in over 30 years.

An additional surprise came when a trio, rather than a pair, of eagles were observed tending to the young. These three adult eagles (a white-tagged male released in 1978 from Montezuma, an unmarked female bird, and a yellow-tagged male bird released in 1982 from the Oak Orchard hacking site) had frequented the same areas of the refuge since 1986.

A nest site examination, completed after the eaglets fledged, revealed that the tree supporting the nest was in very poor condition. The tree was a dead elm and the nest was precariously perched 50 feet up on an overhanging branch. The location of the nest and the deteriorated condition of the tree made it virtually certain that the nest would fall during winter storms or, worse yet, during the spring when eggs or young were in the nest.

In late December, the refuge staff joined forces with the New York State Electric and Gas Corporation (NYSEG) and the New York State Department of Environmental Conservation to stabilize the bald eagle nest. A 75-foot utility pole was installed next to the nest tree by means of a large, tracked Bombardier pole-setting machine. A "cradle" was positioned and bolted into place just under the nest. Working at the top of the pole, the utility's linemen cut the supporting limbs and secured the nest to the new platform.

The trio of eagles produced one young from the pole nest before building a second nest within their nesting territory. The new nest, located in a dead snag on Tschache Pool, has been the site for offspring production since 1990.

The trio of eagles has reproduced an average of two young per year since 1987. Refuge and state biologists will continue to monitor the activities of the bald eagles, assure the integrity of the nest site, and hope for their future success on the refuge.



Birds of Montezuma

**National
Wildlife
Refuge**



New York

Montezuma National Wildlife Refuge in Seneca County, New York, was established in 1937 to provide nesting, resting, and feeding areas for ducks, geese, and many other water birds and songbirds. This refuge contains 6,432 acres of widely diversified habitat, from extensive marshes to upland hardwoods. In addition to meeting habitat requirements for tens of thousands of spring and fall migrant birds, the refuge annually provides wildlife education and recreation to a quarter of a million visitors.

Public uses include a 3.5 mile self-guiding auto tour around the Main Pool, a Visitor Contact Station, a 2-mile hiking trail and ample opportunities to photograph wildlife.



Birding opportunities are best from March through November with peak migrations of waterfowl in mid-April and early October. Warblers are abundant in late May to early June. Summer nesters and broods provide excellent viewing - there is always something to see on a birding tour.

This folder lists 315 species of birds that have been identified on Montezuma Refuge since its establishment in 1937. Please report any sightings of birds that are not included in this list to the Refuge Manager.

Most birds are migratory, therefore, their seasonal occurrence is coded as follows:

SEASON

s - Spring	March - May
S - Summer	June - August
F - Fall	September - November
W - Winter	December - February

† - Birds known to nest on or near the refuge
Italics indicate threatened/endangered species

RELATIVE ABUNDANCE

Relative abundance indicates how frequently you might see a bird in its favored habitat.

a - abundant	a species which is very numerous
c - common	likely to be seen or heard in suitable habitat
u - uncommon	present, but not certain to be seen
o - occasional	seen only a few times during a season
r - rare	may be present but not every year

LOONS - GREBES - CORMORANT

	s	S	F	W
Red-throated Loon	r			
Common Loon	o		o	
Pied-billed Grebe †	c	c	c	
Horned Grebe	o		o	
Red-necked Grebe	r		r	
Double-crested Cormorant	o	c	c	

BITTERNS - HERONS - IBIS

American Bittern †	o	c	c	
Least Bittern †	o	o	o	
Great Blue Heron †	c	c	c	o
Great Egret	o	c	o	
Snowy Egret		r		
Little Blue Heron		r	r	
Cattle Egret	r			
Green-backed Heron †	o	c	o	
Black-crowned Night-Heron †	o	c	c	
Glossy Ibis	r	r		

SWANS - GEESE - DUCKS

Tundra Swan	o		r	o
Mute Swan	o		o	
Snow Goose	c		o	
Brant			o	
Canada Goose †	a	c	c	c
Wood Duck †	c	c	c	
Green-winged Teal †	c	o	c	
American Black Duck †	a	c	a	o
Mallard †	a	c	a	o
Northern Pintail †	c	o	c	
Blue-winged Teal †	c	c	c	
Northern Shoveler †	c	o	c	
Gadwall †	c	c	c	
Eurasian Wigeon	r		r	
American Wigeon †	c	o	c	
Canvasback †	c	o	c	
Redhead †	c	o	c	
Ring-necked Duck	c	o	c	
Greater Scaup	c		c	
Lesser Scaup	o	o	o	
Oldsquaw	o		o	
Black Scoter	r		r	
Surf Scoter	r		r	
White-winged Scoter	r		r	
Common Goldeneye	c		c	
Bufflehead	c		c	
Hooded Merganser †	c	o	a	o
Common Merganser	a	o	a	c

	s	S	F	W
Red-breasted Merganser	o	r	o	
Ruddy Duck †	o		o	
VULTURES - HAWKS - FALCONS				
Turkey Vulture	c	c	c	c
Osprey †	c	c	c	
Bald Eagle †	o	o	o	o
Northern Harrier †	o	o	o	o
Sharp-shinned Hawk †	o	o	o	o
Cooper's Hawk	o	o	o	o
Northern Goshawk	o	o	o	
Red-shouldered Hawk	o		o	
Broad-winged Hawk	o		o	
Red-tailed Hawk †	c	c	c	c
Rough-legged Hawk			o	c
Golden Eagle		o	o	
American Kestrel †	c	c	c	o
Merlin	r		r	
Peregrine Falcon	r		r	
PHEASANT - GROUSE				
Ring-necked Pheasant †	u	u	u	u
Ruffed Grouse †	u	u	u	u
RAILS - CRANES				
King Rail	r	r	r	
Virginia Rail †	c	c	c	r
Sora †	c	c	c	
Common Moorhen †	c	c	c	
American Coot †	c	c	c	
PLOVERS - SANDPIPERS				
Black-bellied Plover	o	o	o	
Lesser Golden-Plover	r	o	o	
Semipalmated Plover	o	c	c	
Killdeer †	c	c	c	
Greater Yellowlegs	c	c	c	
Lesser Yellowlegs	c	c	c	
Solitary Sandpiper	r	o	o	
Spotted Sandpiper †	c	c	c	
Upland Sandpiper		r		
Whimbrel	r		r	
Hudsonian Godwit		r	o	
Ruddy Turnstone	o	o	o	
Red Knot	r	r	r	
Sanderling	r	r	r	
Semipalmated Sandpiper	c	c	c	
Western Sandpiper		r	r	
Least Sandpiper	c	o	c	
White-rumped Sandpiper	o	o	o	
Baird's Sandpiper		r	o	

	s	S	F	W
Pectoral Sandpiper	c	c	c	
Dunlin	c		c	
Stilt Sandpiper	o	c	c	
Ruff		r	r	
Short-billed Dowitcher	c	o	c	
Long-billed Dowitcher			c	
Common Snipe †	o	o	o	
American Woodcock †	o	o	o	
Wilson's Phalarope	r	r		
Red-necked Phalarope	r	o	o	
GULLS - TERNS				
Bonaparte's Gull	o	o	o	
Ring-billed Gull	c	c	c	o
Herring Gull	c	o	c	c
Great Black-backed Gull	o	o	o	u
Caspian Tern	o		o	
Common Tern †	o	o	o	
Black Tern †	o	o	o	
DOVES - OWLS - HUMMINGBIRDS				
Rock Dove †	o	o	o	o
Mourning Dove †	c	c	c	o
Black-billed Cuckoo †	o	o		
Yellow-billed Cuckoo †	o	o		
Barn Owl	r	r	r	r
Easter'n Screech-Owl †	c	c	c	
Great Horned Owl †	c	c	c	c
Snowy Owl				r
Barred Owl †	r	r	r	r
Short-eared Owl	o	r	o	o
Northern Saw-whet Owl	r		r	r
Common Nighthawk		r		
Whip-poor-will	r			
Chimney Swift †	o	o		
Ruby-throated Hummingbird †		o		
Belted Kingfisher †	c	c	c	o
WOODPECKERS - FLYCATCHERS				
Red-bellied Woodpecker †	o	o	o	o
Yellow-bellied Sapsucker	o		o	
Downy Woodpecker †	c	c	c	c
Hairy Woodpecker †	o	o	o	o
Northern Flicker †	c	c	c	o
Pileated Woodpecker †	o	o	o	o
Red-headed Woodpecker	o	o	o	
Olive-sided Flycatcher	r		r	
Eastern Wood-Pewee †		c		
Alder Flycatcher	o	o		
Willow Flycatcher	o	c		

	s	S	F	W
Least Flycatcher †		c		
Eastern Phoebe †	c	c	c	
Great Crested Flycatcher †	o	c		
Eastern Kingbird †	c	c	o	
LARKS - SWALLOWS - JAYS - CROWS				
Horned Lark †	o	o	o	o
Purple Martin †	c	c		
Tree Swallow †	c	c	c	r
Northern Rough-winged Swallow	o	o		
Bank Swallow †	c	c		
Cliff Swallow †	r	r		
Barn Swallow †	c	c	c	
Blue Jay †	c	c	c	c
American Crow †	c	c	c	o
TITMICE - NUTHATCHES - WRENS				
Black-capped Chickadee †	c	c	c	c
Tufted Titmouse	o	o	o	
Red-breasted Nuthatch †	o		o	r
White-breasted Nuthatch †	c	c	c	c
Brown Creeper †	o	o	o	o
Carolina Wren	r	r	r	
House Wren †	c	c		
Winter Wren †	c	c	c	
Sedge Wren †	r	r		
Marsh Wren †	c	c	c	
KINGLETS - THRUSHES - THRASHERS				
Golden-crowned Kinglet	c		c	
Ruby-crowned Kinglet	c		c	
Blue-gray Gnatcatcher	o		o	
Eastern Bluebird †	u	u	u	r
Veery †	c	c	o	
Gray-cheeked Thrush	o		o	
Swainson's Thrush	o		o	
Hermit Thrush	c		c	
Wood Thrush †	c	c	o	
American Robin †	c	c	c	o
Gray Catbird †	c	c	c	
Northern Mockingbird	r	r		
Brown Thrasher †	o	o	o	
WAXWINGS - SHRIKES - STARLINGS				
Water Pipit	c		c	
Cedar Waxwing †	o	o	o	o
Northern Shrike				o
Loggerhead Shrike	r	r		
European Starling †	a	a	a	o
VIREOS - WOOD WARBLERS				
Solitary Vireo	o		o	

	s	S	F	W
Yellow-throated Vireo †	o	o		
Warbling Vireo †	c	c	c	
Philadelphia Vireo	r		r	
Red-eyed Vireo †	c	c	c	
Blue-winged Warbler	r			
Golden-winged Warbler	o	o		
Tennessee Warbler	o		o	
Orange-crowned Warbler	r			
Nashville Warbler	c		c	
Northern Parula	o		o	
Yellow Warbler †	c	c	c	
Chestnut-sided Warbler	o		o	
Magnolia Warbler	c		c	
Cape May Warbler	c		c	
Black-throated Blue Warbler	c		c	
Yellow-rumped Warbler	c		c	
Black-throated Green Warbler	c		c	
Blackburnian Warbler	c		c	
Pine Warbler	o		o	
Prairie Warbler	o		o	
Palm Warbler	o		o	
Bay-breasted Warbler	o		o	
Blackpoll Warbler	c		c	
Cerulean Warbler †	c	o	c	
Black-and-white Warbler	c	o	c	
American Redstart †	c	c	c	
Prothonotary Warbler †	o	o		
Ovenbird †	c	c	c	
Northern Waterthrush	o	o	o	
Louisiana Waterthrush	o	o	o	
Connecticut Warbler	r		r	
Mourning Warbler	o	o	o	
Common Yellowthroat †	c	c	c	
Hooded Warbler	r		r	
Wilson's Warbler	o		o	
Canada Warbler	c		o	
Yellow-breasted Chat	r	r		
TANAGERS - SPARROWS				
Scarlet Tanager †	c	o	o	
Northern Cardinal †	c	c	c	c
Rose-breasted Grosbeak †	c	c	c	
Indigo Bunting †	c	c		
Rufous-sided Towhee †	c	o	c	
American Tree Sparrow			c	c
Chipping Sparrow †	c	c	c	
Field Sparrow †	c	c	c	o
Vesper Sparrow †	o	o	o	

	s	S	F	W
Savannah Sparrow †	o	o	o	
Grasshopper Sparrow †	o	o	o	
Henslow's Sparrow †	o	o	o	
Fox Sparrow	c		c	
Song Sparrow †	c	c	c	o
Lincoln's Sparrow	o		o	
Swamp Sparrow †	c	c	c	
White-throated Sparrow	c		c	
White-crowned Sparrow	c		c	
Dark-eyed Junco	o	o	o	
Lapland Longspur				o
Snow Bunting				o
BLACKBIRDS - FINCHES				
Bobolink †	o	o	c	
Red-winged Blackbird †	a	a	a	o
Eastern Meadowlark †	c	c	c	o
Rusty Blackbird	o		o	
Common Grackle †	a	a	a	o
Brown-headed Cowbird †	c	c	a	o
Northern Oriole †	c	c	c	
Purple Finch †	c	o	c	o
House Finch †	o	o	o	o
Common Redpoll				r
Pine Siskin				r
American Goldfinch †	c	c	c	o
Evening Grosbeak	r		r	r
House Sparrow †	c	c	c	c

NOTES

Date _____ Time _____

Observers _____

Weather _____

Tides _____

ACCIDENTALS

The following species have been seen on the refuge one or two times:

Western Grebe	Parasitic Jaeger
Eared Grebe	Glaucous Gull
Leach's Storm-Petrel	Iceland Gull
Wilson's Storm-Petrel	Little Gull
American White Pelican	Least Tern
Northern Gannet	Arctic Tern
Black Swan	Roseate Tern
Pink-footed Goose	Forster's Tern
White-fronted Goose	Gull-billed Tern
Bar-Headed Goose	Razorbill
Egyptian Goose	Thick-billed Murre
Cinnamon Teal	Dovekie
Shelduck	Black Guillemot
Fulvous Whistling Duck	White-winged Dove
Barrow's Goldeneye	Long-eared Owl
King Eider	Scissor-tailed Flycatcher
Red-crested Pochard	Western Kingbird
Masked Duck	Say's Phoebe
Gyr Falcon	Yellow-bellied Flycatcher
Turkey	Acadian Flycatcher
Northern Bobwhite	Gray Jay
Tricolored Heron	Common Raven
Yellow-crowned Night-Heron	Boreal Chickadee
White Ibis	Sprague's Pipit
Greater Flamingo	Bohemian Waxwing
Sandhill Crane	Yellow-headed Blackbird
Yellow Rail	Brewer's Blackbird
Black Rail	Boat-tailed Grackle
Purple Gallinule	Blue Grosbeak
American Avocet	Pine Grosbeak
Black-necked Stilt	European Goldfinch
Northern Lapwing	White-winged Crossbill
Piping Plover	Dickcissel
Marbled Godwit	Sharp-tailed Sparrow
Buff-breasted Sandpiper	Lark Sparrow
Red Phalarope	Clay-colored Sparrow



U.S. Fish and Wildlife Service

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The Service also manages National Fish Hatcheries, and provides Federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

For further information contact:

Refuge Manager
Montezuma National Wildlife Refuge
3395 Rts. 5 & 20 East
Seneca Falls, New York 13148
Telephone: (315) 568-5987



**DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE**

Wildlife Drive

MONTEZUMA
National Wildlife Refuge



Seneca Falls, New York

WELCOME

The next 3.5 miles of Montezuma's Wildlife Drive will introduce you to the fascinating world of wetlands. Refuge wetlands provide resting, feeding, and nesting habitats for numerous species of waterfowl and other types of waterbirds.

The 1,600-acre wetland you see on your left was restored by the U.S. Fish & Wildlife Service after having been lost in the early 1900's when the vast "Montezuma Swamp" was drained. On your right is the New York State Barge Canal. In 1938, the U.S. Fish and Wildlife Service built dikes around portions of the drained marshes. By the early 1940's, water, the lifeblood of wetlands, was restored. As wetland plant communities slowly returned, a rich diversity of waterfowl, waterbirds, and other wildlife again became abundant on the water and in the air.

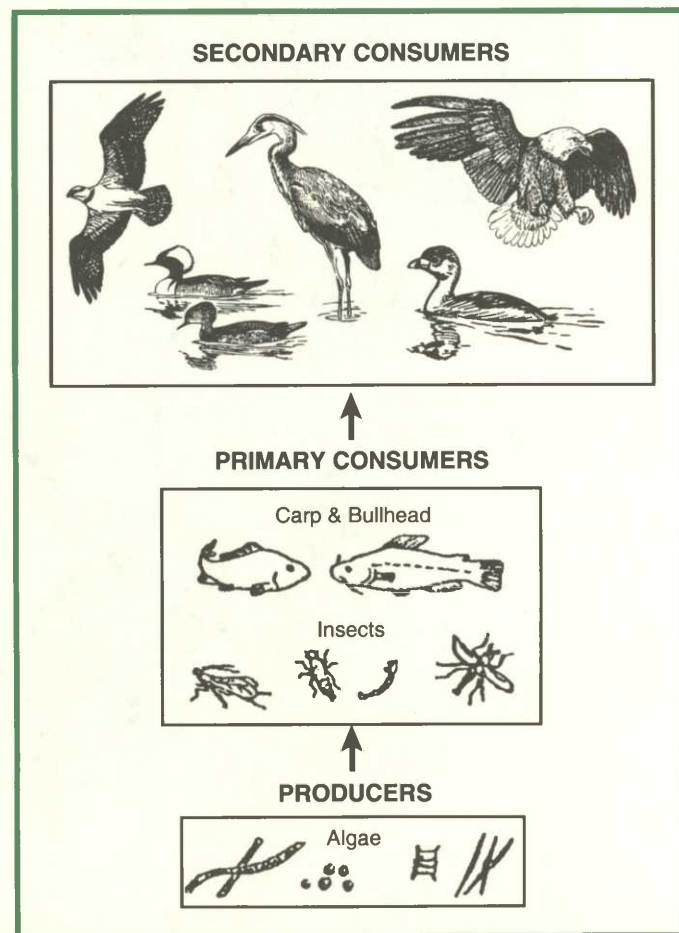
WATER MANAGEMENT

1 All of the refuge pools are shallow, averaging approximately 1.5 feet in depth. The actual depth of the water in any pool at any season of the year is carefully planned and managed. This management is done to create conditions which will lead to the best "mix" of submerged aquatic plants, emergent plants, and open water. Ideally, this "mix" would be $\frac{1}{3}$ emergent plants, $\frac{1}{3}$ submerged aquatics, and $\frac{1}{3}$ open water. It is this mix of plant communities which creates habitats – the places animals live – where resting, feeding, nesting, and the rearing of young occur.

HABITATS

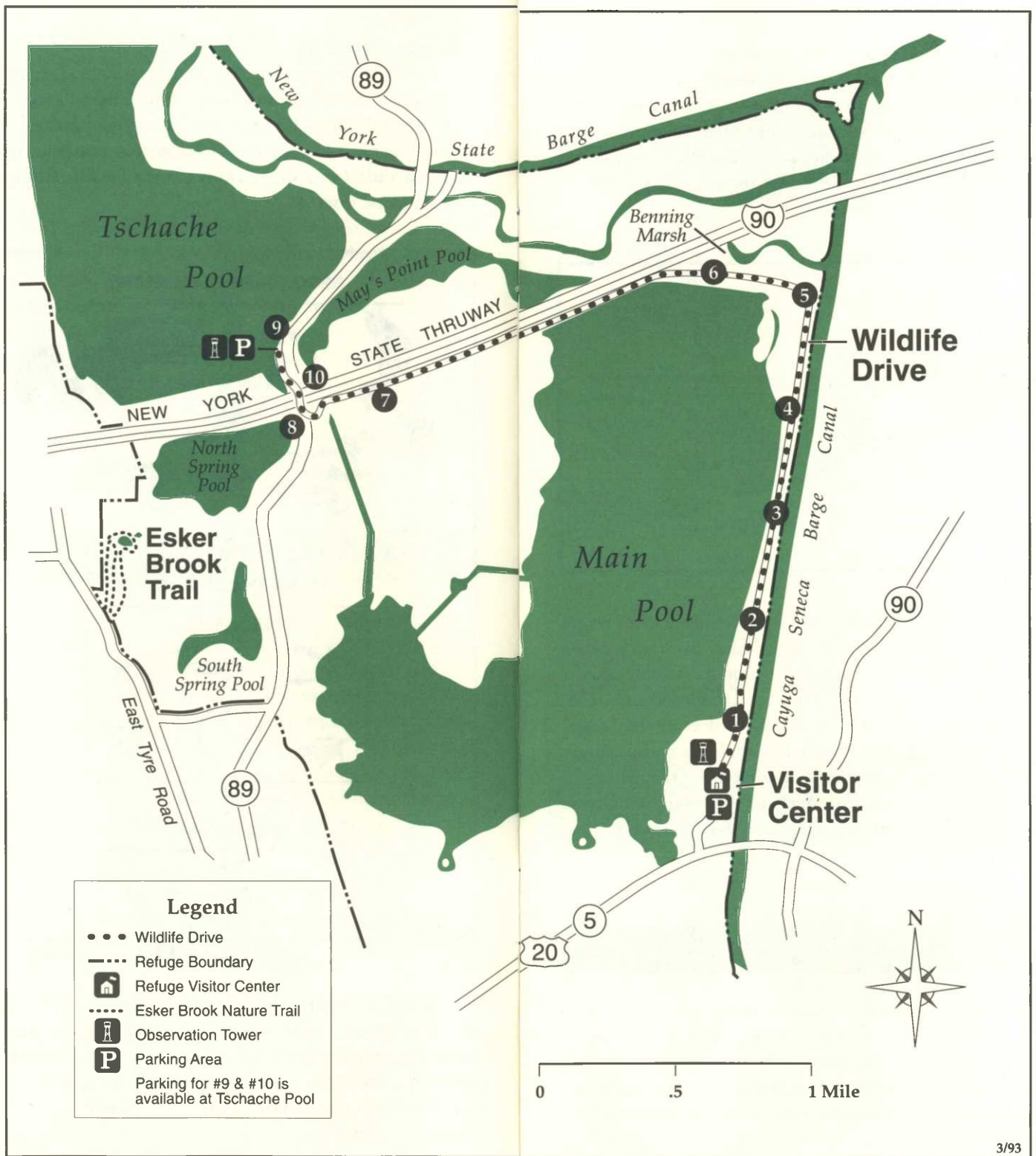
2 During most of the growing season, the eye is deceived by what appears to be open water. In fact, just under the surface are vast mats of submerged aquatic plants – sago pondweed, water milfoil, waterweeds, coontail, bladderwort, and others. This aquatic plant bed teems with aquatic insects and crustaceans, as well as small fish such as sticklebacks.

Entire food chains and food webs thrive just below the water's surface. Predator-prey relationships among dragonfly nymphs, predaceous water beetles, fairy shrimp, midge larvae, and other animals are as fierce as any among land animals in a tropical jungle. Many species of ducks consume plant materials and seeds. Great blue herons capture the fish, frogs, and larger aquatic insects.

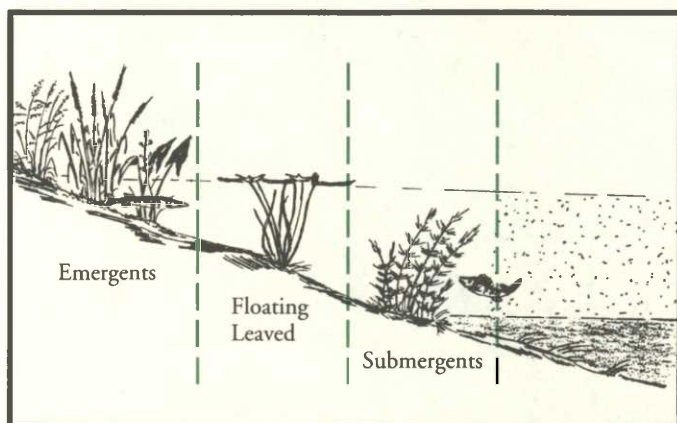


Typical Food Chains at Montezuma

At certain seasons, large mats of algae cover portions of the water's surface. At other times, emerald-green mats of duckweed (small individual floating plants with tiny dangling root hairs) cover the quieter zones. All of these provide food for waterbirds and waterfowl, as well as habitat for a diverse host of smaller organisms.



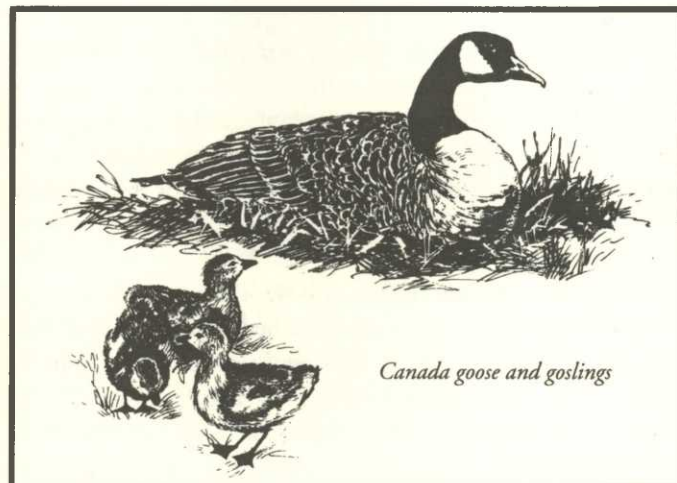
The emergent aquatic plants you see are mostly cattail and purple loosestrife. Purple loosestrife is a "problem" species for us. To learn more about loosestrife control efforts, secure a copy of our purple loosestrife brochure at the Visitor Center. All of the emergent plant communities provide nesting and escape cover from predators for many species of young waterbirds and waterfowl.



As you view the pool, look very carefully at areas where two or more habitats converge. This "edge" between habitats provides a richer, more diverse attraction for wildlife since it merges the benefits of both habitats in a single location. This principle applies whether searching for deer at the "edge" between grassland and woodland, or looking for young ducklings feeding in an open area adjacent to tall, emergent vegetation. Our primary management goal is to manipulate water levels in a manner which produces as much "edge effect" as possible.

WILDLIFE

3 The kinds of wildlife using the refuge, and their overall numbers, are determined by the diversity and abundance of habitats that are available. In fact, "wildlife management" is actually "habitat management." We do not "manage" animals; we manipulate plant communities which in turn provide habitats for the animals which use them.



Very large numbers of Canada geese, snow geese, and ducks visit Montezuma during spring and fall. Tundra swans also use the refuge during the same periods. Mallards, American black ducks, blue-winged and green-winged teal, American wigeon, northern shovelers, and wood ducks are frequent dabbling duck species. Common diving ducks are canvasbacks, scaup, redheads, and common and hooded mergansers. Great blue herons, green-backed herons, American coots, common moorhens, bitterns, and other birds are frequently seen along the drive. A complete bird list for Montezuma is available at the Refuge Visitor Center.

THE NEW YORK STATE BARGE CANAL

4 Excess water is discharged into the canal through structures similar to this one. However, during seasonal high water periods, the canal sometimes rises so high that it backflows into the pools. Due to wetland destruction, agricultural drainage, and urban development, the nature of the barge canal has changed because it is forced to accept far more water than in earlier times.

Changes in the canal have created unique management problems for the refuge. Carp, exotic fish of Eurasian origin, have become firmly established in the canal. During high

water periods in the canal, literally hundreds of thousands of carp attempt to gain access into shallow refuge pools to complete their breeding cycle. Once inside, their activities stir up so much silt that sunlight cannot penetrate the water, and plant growth is retarded. The carp often uproot those plants which do develop.

For years, drainage of the pools was done to remove carp. Unknowingly, the drawdowns disturbed the niches for native plant species and allowed yet another Eurasian exotic, purple loosestrife, to become established. From a few plants in 1953, purple loosestrife on the refuge expanded to cover 1,250 acres in the late 1970's. Advances in knowledge and changes in management practices during the past decade have led to major reductions in carp and purple loosestrife in the pools.

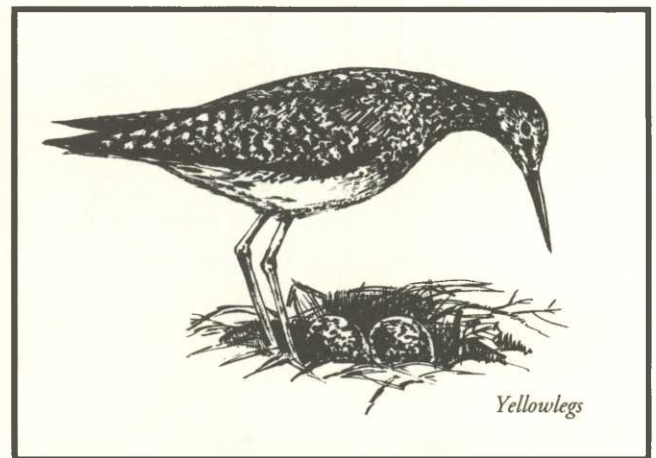
GRASSLANDS

5 The refuge manages almost 300 acres of grasslands by periodically mowing them and by controlling undesirable plant species. The grasslands you see are used as nesting habitats by several species of ducks. The grasslands also provide abundant foraging (feeding) areas where hawks, owls, foxes, and other animals search for voles, field mice, rabbits, and other prey species.



SHOREBIRD MANAGEMENT

6 Shorebirds are relatively small, and are found wading in very shallow water or walking on exposed mudflats. They probe with their specially-adapted bills in the soft mud for aquatic insects and crustaceans. Numerous species of birds fall into this category. They include yellowlegs, sandpipers, plovers, and many others. The refuge manages water levels in Benning Marsh and May's Point Pool to accommodate the needs of shorebirds. Water levels in both pools are slowly drained in spring and fall so that migrating shorebirds can find the rich mudflats they require for resting and feeding.

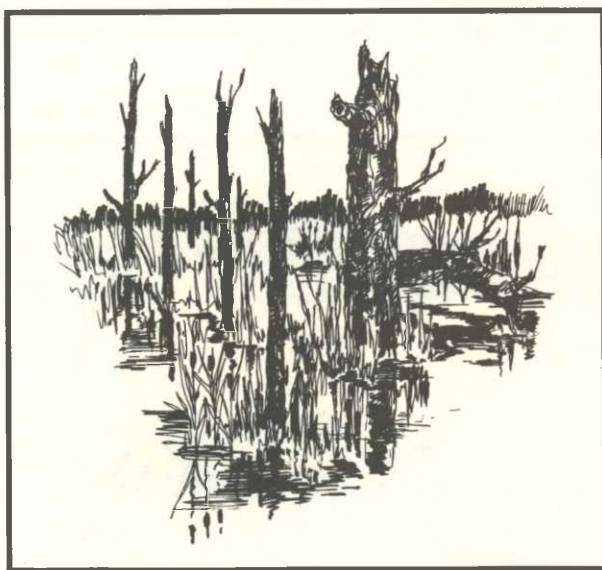


DRY MARSH

7 The large cattail area adjacent to the Wildlife Drive and the New York State Thruway has always been shallower than the rest of the refuge pools. As recently as 25 years ago, portions of the area were "farmed" (planted to small grain, annual rye grass, etc.) to attract Canada geese and other waterfowl. The monotypic nature of the plant community (cattail stands) and its shallow nature prevent its use by waterfowl or other waterbirds. Plans call for mechanically opening up areas of the "dry marsh" in future years to create more diverse habitats for wildlife.

NORTH SPRING POOL

8 The small pool directly across Route 89 is spring-fed and shallow. Trees were left standing 35 years ago when the area was flooded. Only remnants remain. The water has a very high mineral content due to its spring origins. Waterfowl nesting occurs on some of the hummocks and dikes. In fall, portions of the pool serve as resting and feeding areas for large numbers of wood ducks and American wigeon.



TSCHACHE POOL

9 Tschache Pool is 1,300 acres in size, and like the North Spring Pool, contained live timber which was left standing when the pool was flooded. After over 50 years, the few dead trees you see are all that remain of this forested wetland. During spring and fall migration, large numbers of Canada geese and ducks use the pool. Starting in 1976 and continuing through 1980, this pool was host to the North American continent's first bald eagle hacking program. Twenty-three eaglets took their first flight from the 40-foot hacking platform overlooking this pool. It is fitting that there is now an active, productive eagle nest in the Tschache Pool.

MAY'S POINT POOL

10 The 200-acre May's Point Pool is the refuge's largest shorebird management unit. In April and May, and again during early August to mid-October, water levels are slowly dropped to create a continuously wet band of exposed mudflats around the pool. In most years, the numbers and types of shorebirds using the area can be among the largest in central New York State. Waterfowl, especially the teal and shovelers, often use the pool during fall months. Most sightings of peregrine falcons on the refuge occur around this pool as this rare, swift falcon stalks its prey from among the large congregations of birds.

We truly hope that what you have seen and learned today has spurred your interest in discovering more about the fascinating relationships in wetlands. Numerous field guides, publications, and films are available about the subject. Talk to staff on national wildlife refuges, with State wildlife departments, and with private conservation groups. The world of wetlands and wildlife is your legacy to our nation's children, and to their children.



U.S. FISH AND WILDLIFE SERVICE

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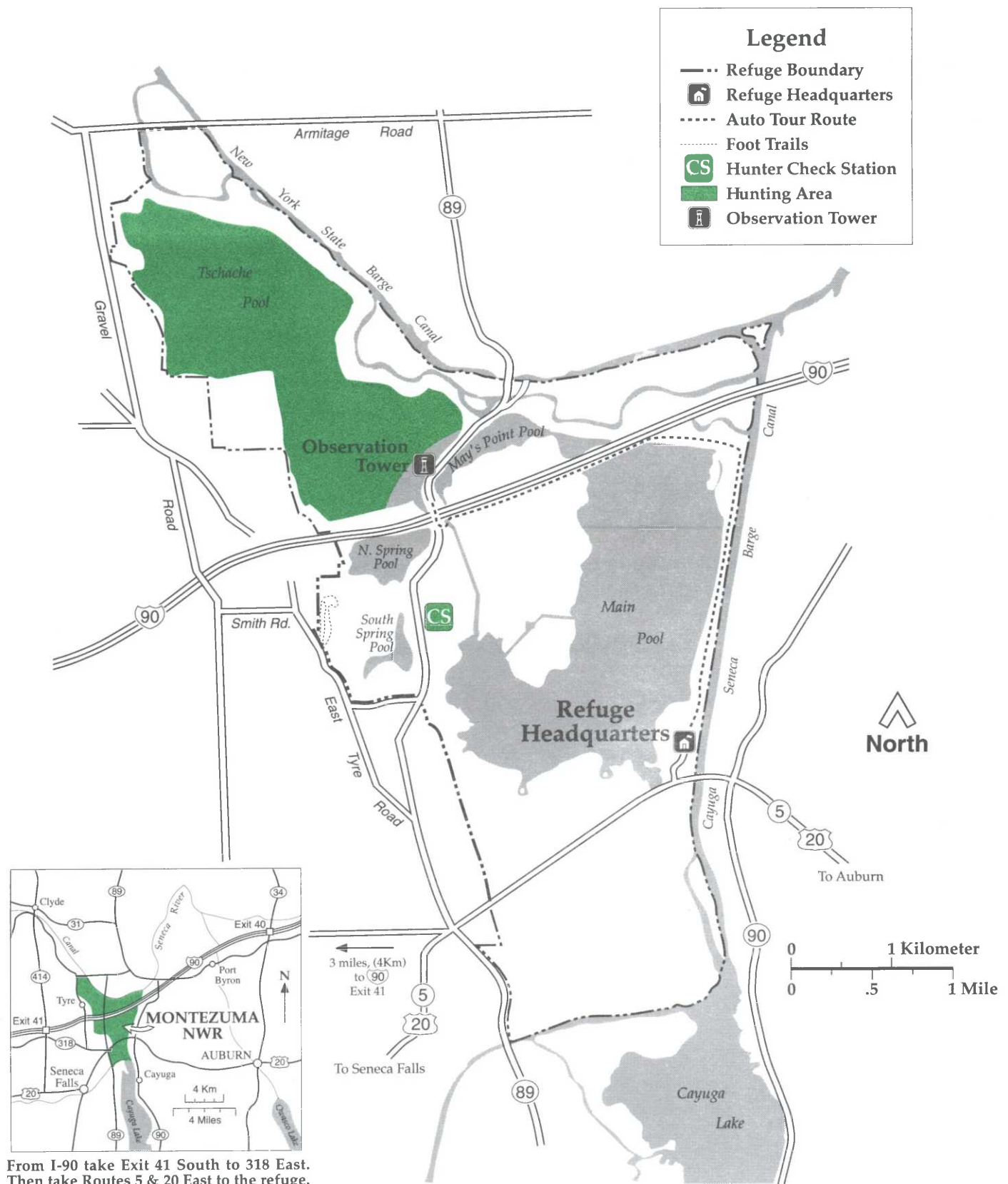
Refuge Manager
Montezuma National Wildlife Refuge
3395 Routes 5 & 20 East
Seneca Falls, NY 13148
Telephone: (315) 568-5987



DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

Waterfowl Hunt Regulations

MONTEZUMA NATIONAL WILDLIFE REFUGE



1995 WATERFOWL HUNT - MONTEZUMA NATIONAL WILDLIFE REFUGE

DATES: Tuesdays, Thursdays and Saturdays From October 19 to November 18.

RESERVATIONS: Limited to 20 reservations per day (Maximum of 2 people per reservation).

- * Telephone reservations taken from 8:00 a.m. to 8:30 a.m. on Tuesdays, Thursdays and Saturdays for the next hunt day (call Tuesday to hunt Thursday, call Thursday to hunt Saturday).
- * The reservation telephone number is **(315) 568-4136.**

*****RESERVATIONS FOR OPENING DAY WILL BE TAKEN ON THE DAY BEFORE.*****

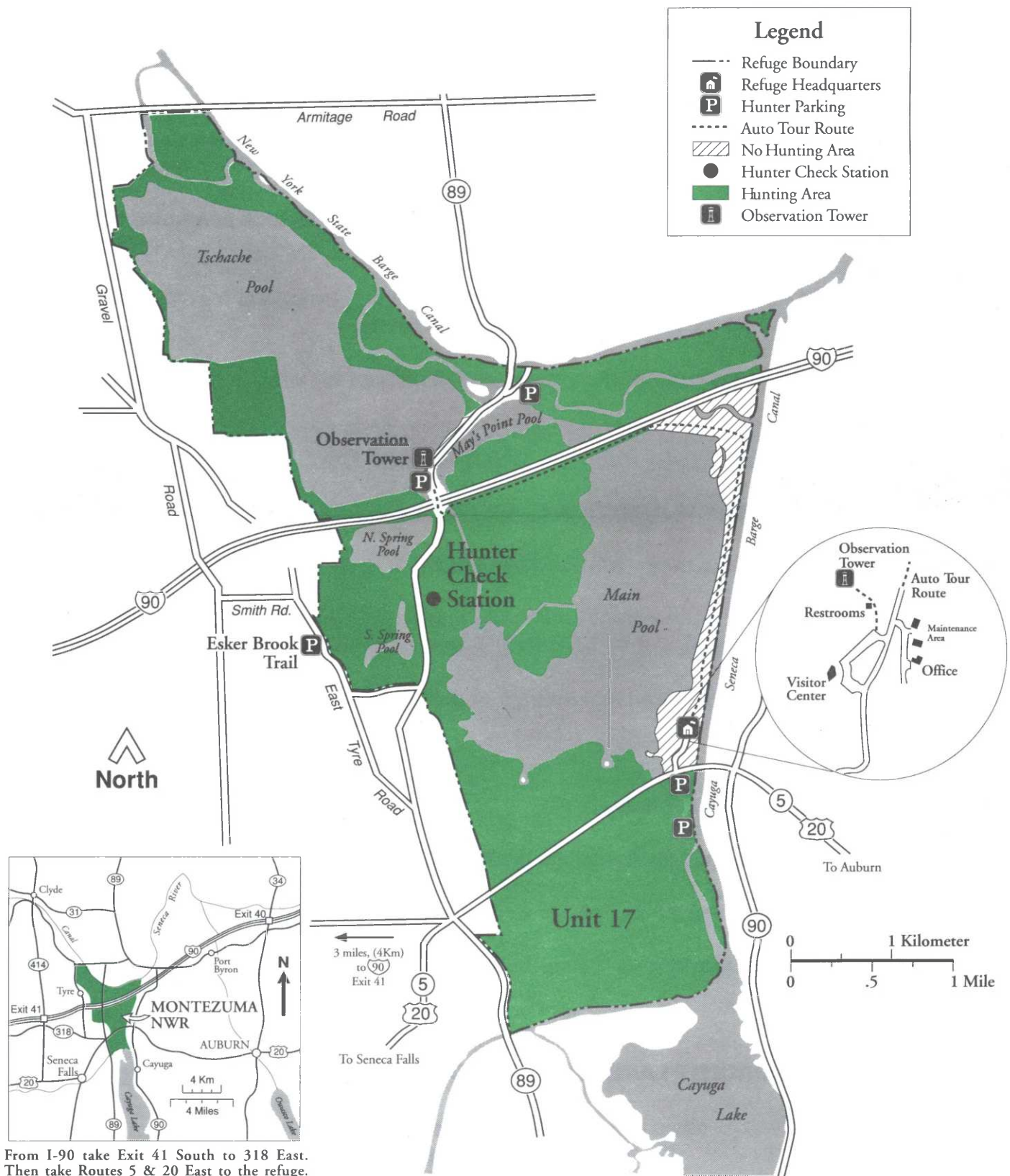
- * All reservations are first-come, first-served. Persons with a reservation may bring 1 companion. Hunters reserve the parking area of their choice while making their hunt reservation.
- * All hunters with reservations (and their companions) must check in at least 1 hour before legal shooting time or forfeit their reservation.
- * Reservations unfilled / unclaimed by 1 hour before legal shooting time will be available on a first-come, first-served basis at the Route 89 Check Station. All regulations applicable to reservation hunters also apply to stand-by hunters.
- * Special accommodations are available to persons with a Disabled Hunting License or a Golden Access Passport.

FEES: A \$10.00 per reservation fee is required. If a person has either a Golden Age or Golden Access Passport, the reservation fee is \$5.00.

ADDITIONAL REGULATIONS

Deer Hunt Regulations

MONTEZUMA NATIONAL WILDLIFE REFUGE



1995 FIREARMS HUNT REGULATIONS-MONTEZUMA NATIONAL WILDLIFE REFUGE

DMU #86

DATES: November 20-25 and December 2-12 (no Sunday hunting).

PERMIT CARDS & PARKING PASSES: *Must be picked up daily*

- * 115 permits are available each hunt day on a first-come, first-served basis. Special accommodations are available to persons with a Disabled Hunting License or Golden Access Passport.
- * **Opening Day Permits** - available at the Route 89 Check Station.
- * **Remainder of the Season Permits** - available at the Route 89 Check Station on a self-service basis from the Permit Box.
- * Complete **PART A** of the permit card at check in and leave it with Refuge personnel or in the Part A box at the Route 89 Check Station.
- * Carry **PART B** of the permit card while hunting on the Refuge. Complete it at the end of the day and leave it in the Part B box at the Route 89 Check Station.
- * Parking passes are to be picked up at check in and displayed on vehicle dashboards.

**SUCCESSFUL HUNTERS ON NOVEMBER 20 & 25 AND DECEMBER 2, 9 and 12
MUST BRING THEIR DEER TO THE ROUTE 89 CHECK STATION.**

*****NOTICE*** ADDITIONAL REGULATIONS ***NOTICE*****

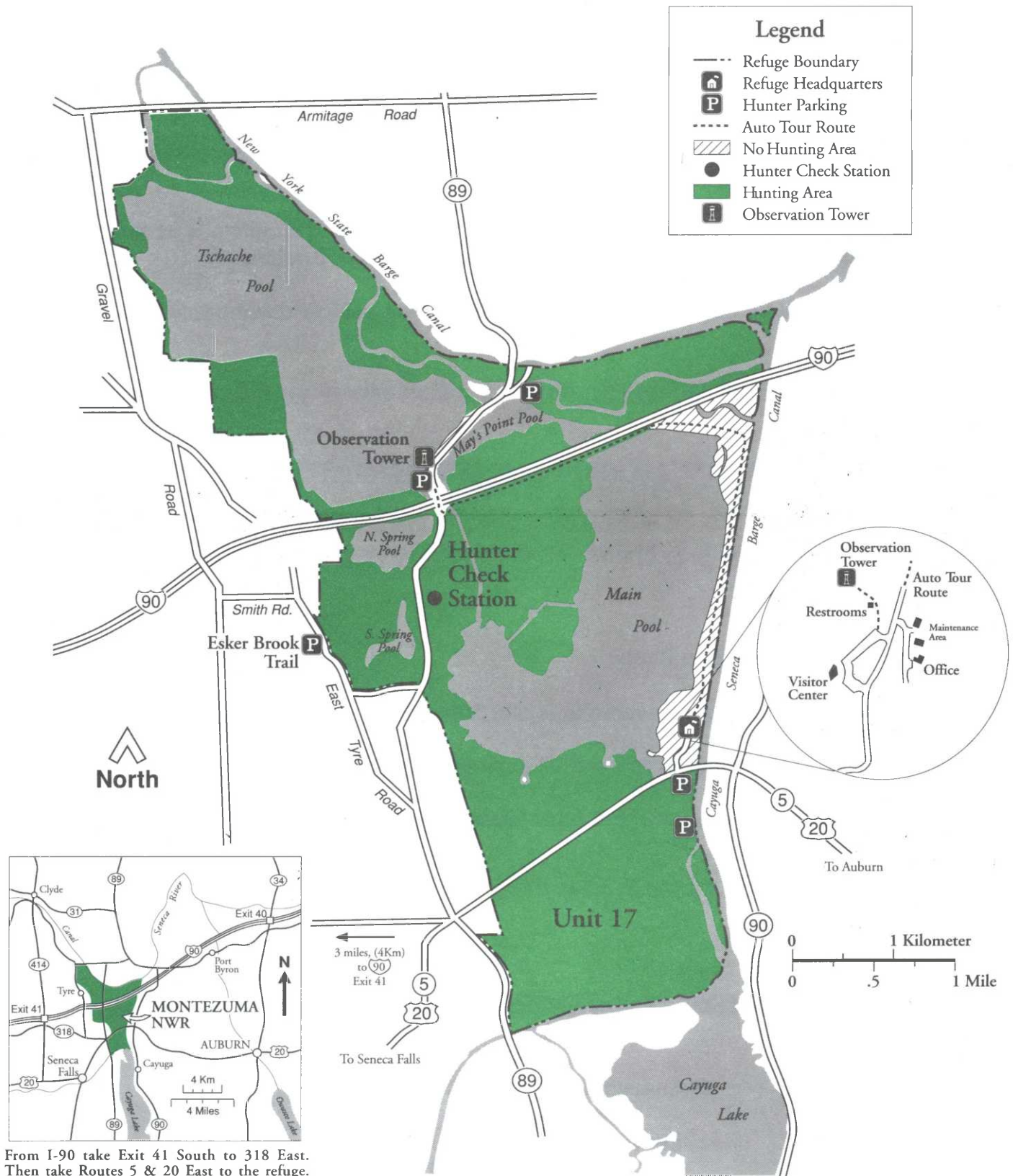
- * Shotguns and Muzzleloaders only - **NO HANDGUNS!!!**
- * Hunters must wear on the head, chest and back (a vest & hat) at least 400 square inches (2,600 square centimeters) of SOLID BLAZE ORANGE - **NO CAMO ORANGE or RED!!!**
- * Firearms must be unloaded before legal sunrise and after legal sunset.
- * No advance scouting.
- * No boats or canoes on Refuge pools.
- * Use or possession of alcoholic beverages is prohibited.
- * Tree stands must be removed at the end of each hunt day - no screw-in tree steps!!!
- * Hunters are permitted on the Refuge 1 hour before legal sunrise and 1 hour after legal sunset.
- * Obey ALL signs.

RESPECT ADJACENT LANDOWNERS PROPERTY - DO NOT TRESPASS!!!

Montezuma National Wildlife Refuge
3395 Route 5/20 East
Seneca Falls, New York 13148
(315) 568-5987

Deer Hunt Regulations

MONTEZUMA NATIONAL WILDLIFE REFUGE



1995 ARCHERY HUNT - MONTEZUMA NATIONAL WILDLIFE REFUGE

DATES: November 1-18 and December 13-16 (no Sunday hunting).

PERMIT CARDS & PARKING PASSES: *Must be picked up daily*

- * Daily permit cards available for the entire season at the Route 89 Check Station. Special accommodations are available to persons with a Disabled Hunting License or a Golden Access Passport.
- * Complete **PART A** of the permit card at check in and leave it with Refuge personnel or deposit it in the Part A box at the Route 89 Check Station.
- * Carry **PART B** of the permit card while hunting on the Refuge. Complete it at the end of the hunt day and leave it in the Part B box at the Route 89 Check Station.
- * Parking passes are to be picked up daily and displayed on vehicle dashboards.

SUCCESSFUL OPENING DAY HUNTERS: Must bring their deer to the Route 89 Check Station!

*****NOTICE*** ADDITIONAL REGULATIONS ***NOTICE*****

- * Bows must be disassembled, locked or cased before legal sunrise and after legal sunset.
- * No advance scouting.
- * No boats or canoes on Refuge Pools.
- * Use or possession of alcoholic beverages is prohibited.
- * Tree stands must be removed at the end of each day - **no screw-in steps!!!**
- * Hunters are permitted on the Refuge 1 hour before legal sunrise (2 hours on opening day) and 1 hour after legal sunset.
- * Obey **ALL** signs.

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